

GB110

Service Manual



Table Of Contents

1. INTRODUCTION.....	3		
1.1 Purpose.....	3		
1.2 Regulatory Information.....	3		
2. PERFORMANCE.....	5		
2.1 H/W Features.....	5		
2.2 S/W Features.....	6		
3. TECHNICAL BRIEF.....	13		
3.1 Digital Main Processor(PMB7890).....	13		
3.2 Memory chip (S71GL064NA0BFW0Z0).....	18		
3.3 Power Amplifier Module (SKY77518)	21		
3.4 RF SAW (B9308).....	22		
3.5 Audio Amplifier (TPA6205A1).....	23		
3.6 Charger IC (MP26021).....	24		
3.7 Camera Driver (AIT701A).....	26		
3.8 FM Radio (Si4703).....	30		
3.9 LCD Interface.....	32		
3.10 SIM Card Interface.....	34		
3.11 KEYPAD Interface.....	35		
3.12 Key LED Interface.....	36		
3.13 Vibrator Interface.....	37		
3.14 Micro SD Interface.....	38		
4. TROUBLE SHOOTING.....	39		
4.1 Power On Trouble.....	39		
4.2 SIM Card Trouble.....	42		
4.3 Vibrator Trouble.....	44		
4.4 Keypad Trouble.....	46		
4.5 RTC Trouble.....	48		
4.6 Key Backlight Trouble.....	50		
4.7 LCM Backlight Trouble.....	53		
4.8 LCM Trouble.....	55		
4.9 Microphone Trouble.....	57		
4.10 Receiver Trouble.....	59		
4.11 Speaker Trouble.....	61		
4.12 Headphone Trouble.....	63		
4.13 Charging Trouble.....	67		
4.14 FM Radio Trouble.....	69		
4.15 Camera Trouble.....	75		
4.16 Micro SD Trouble.....	78		
4.17 RF Trouble.....	80		
5. DOWNLOAD.....	93		
5.1 Download setup.....	93		
5.2 Download Process.....	95		
6. BLOCK DIAGRAM.....	106		
7. CIRCUIT DIAGRAM.....	107		
8. BGA IN PIN Check.....	113		
9. PCB LAYOUT.....	116		
10.ENGINEERING MODE.....	118		
11.CALIBRATION.....	120		
11.1 Test equipment setup.....	120		
11.2 APT Technologies.....	120		
12. Stand alone test.....	135		
12.1 Test Program Setting.....	135		
12.2 TX Test	137		
12.3 RX Test.....	138		
13. EXPLODED VIEW& REPLACEMENT PART LIST.....	139		
13.1 Exploded View.....	139		
13.2 Replacement Part.....	142		

1. INTRODUCTION

1.1 Purpose

This manual provides information necessary to repair, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part(for example , persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. system users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use .The manufacturer dose not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunications service of facilities accessed through or connected to it.

The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent . The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that authorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Devices(ESD),are indicated  by the sign .

Following information is ESD handing:

- . Service personnel should ground themselves by using a wrist strap when exchange system boards.
- . When repairs are made to a system board , they should spread the floor with anti-static mat which is also grounded .
- . Use a suitable, grounded soldering iron .
- . Keep sensitive parts in these protective packages until these are used.
- . When returning system boards or parts like EEPROM to the factory, use the protective packages as described.

2. PERFORMANCE

2.1 H/W Features

Solution	EGOLD Voice v2 (ULC2+)	Infineon
Type	Bar type	
Antenna Type	Internal (dual-Band)	
Main Display	1.5" 128x128 CSTN/65k	
Camera	Yes, VGA	
Battery	950mAh Li-ion inner pack	950mAh: 55x34x50mm
FM Receiver	Yes , US/Europe band support	(87.5~108MHz)
Embedded FM antenna	Yes	Pogo pin contact FPC type FM Antenna on Battery cover.
Loud Speaker	Yes	
Memory Size	64Mb+16Mb	User memory at least 1MB
Memory Card	Yes, Micro SD (up to 2GB)	Flip type u-SD holder under battery
LMT (Lost Mobile Tracker)	Yes	LMT for: AMA M-DOG: China

2.2 S/W Features

Feature	Detail Item	Description	
OS	OSE	Operating System	Y
Audio	Speech Code	FR,EFR,HR,AMR-NB	Y
	AMR code	GSM Full Rate 3GPP Adaptive Multi Rate (AMR-NB)	Y
	FM Radio		Y
	MP3 Ring Tone	MP3 decode	Y
	Integrated hands free speaker	Speaker phone mode	Y
	Key Tone Volume	6 Level (Include Mute)	Y
	Ring Tone Volume	6 Level (Include Mute)	Y
	Ring Tone	MP3 ring tone/10 Midi	Y
	Call Alert type	Ring, Vibrate, Ring & Vibrate, Ring after vibrate, Silent	Y
	Earpiece Volume	6 Level (Include Mute)	Y
	Mute		Y
Frequency Bands	GSM dual band MS 900-1800	Configuration is during software compile time.	Y
	PCS dual band MS 850-1900	N/A	N
Date Service	Circuit		N
	Packet		N
Connectivity	Infrared (IrDA)		N
	Bluetooth		N
	USB		N
	USB Mass storage		N
	RS232(UART)	Only for Phone tool & download	Y
Voice Function	Voice Recording		N

	Voice Command		N
	Answering machine		N
Camera	Capture Size	128x128, 160x120, 320x240, 640x480	Y
	Preview Size	Full Screen: 128x128	Y
	Quality	Low, Normal, High	Y
	EV	+4, +3, +2, +1, 0, -1, -2, -3, -4	Y
	WB	Auto, Daylight, Tungsten, FLUORESCENT, Cloud, INCANDESCENCE	Y
	Zoom	640x480 : 1x 320x240 : 1x, 2x 160x120/128x128 : 1x, 2x, 4x	Y
	Effect	Normal, Sepia, Grayscale, Color invert	Y
	Continuous Shot	1 Shot, 3 shot, 6 shot	Y
	Self Timer	3 seconds, 5 seconds, 10 seconds	Y
	Shutter tone	Off, tone1, tone2, tone3	Y
	Storage	Phone/SD card	Y
	Reset Setting	Restore to default setting	Y
Image Viewer	Browse detail image Info		Y
	Full Screen View		Y
File Manager	Browse file tree		Y
	Copy, Rename, Delete, Move files		Y
	Rename, Delete, Multi-Delete, Create folder		Y
Display	RSSI	6 level (0~5 level)	Y
	Battery level	4 level (0~3 level)	Y
	RTC	Date & Time Display	Y

	PLMN/Service Indicator		Y
	Quick Access Mode In Idle	Profile/ SMS + Voice Mail	Y
	Dimming Clock		N
	Dual Clock		N
	Home shortcut	Display Shortcut icon in Idle	Y
Call History	Last Dial Number	Max : 20 records	Y
	Last Received Number	Max : 20 records	Y
	Last Missed Number	Max : 20 records	Y
	Scratch Pad Memory		N
	Call Duration	Last Call time, Total Call Time	Y
Call Cost	Last Call Charge Units		N
	Total Charge Units		N
Call Management	Call Waiting		Y
	Call Swap		Y
	Call Retrieve		Y
	Auto Answer	Not supported in Headset Mode	Y
	Auto Redial		Y
	Calling Line		Y
	Full Call Divert		Y
	Speed Dialing		Y
	Last Number Redial		Y
	Multi Party Call		Y
	ECT	Explicit Call Transfer (4 + Send)	N
Network	Automatic Network Selection		Y
	Manual Network		Y

	Preferred Network		Y
	Network Service Status		Y
DTMF	DTMF Signaling		Y
	DTMF Enable & Disable		Y
Cell Broadcast	Read Cell Broadcast		Y
	On/Off setting	Receive On/Off	Y
	Alert setting		Y
	Language setting		Y
	Topics Setting		Y
Contacts(Phone Book)	Entry	500	Y
	Field	Name, Mobile, Home, Office	Y
	Copy	ME <-> SIM	Y
	Move	ME <-> SIM	Y
	FDN		Y
	SDN		Y
	Email Entry		N
	Picture ID		N
	Video Caller ID		N
	vCard		N
	Business Card		Y
	Delete	Delete, Delete All(SIM or Phone), Multi Delete	Y
Supplementary Services	CFU	Call Forwarding Unconditional	Y
	CFB	Call Forwarding on Mobile Subscriber Busy	Y
	CFNRy	Call Forwarding on No Reply	Y
	CFNRc	Call Forwarding on Mobile Subscriber Not Reachable	Y
	BAOC	Barring of All Outgoing Calls	Y
	BOIC	Barring of Outgoing International Calls	Y

	BOICexHC	Barring of Outgoing International Calls except those directed to the Home PLMN Country	Y
	BAIC	Barring of All Incoming Calls	Y
	BICRoam	Barring of Incoming Calls when Roaming Outside the/Home PLMN Country	Y
	Conference Call	Up to 5	Y
SIM	Plug in Type	3V & 1.8 V	Y
	SIM Lock	Service Provider / Network Lock	Y
	SIM Toolkit	Class 3	Y
Short Message	Read Message		Y
	Write and Edit Message		Y
	Send and Receive Message		Y
	Reply to Message		Y
	Forward Message		Y
	Extract Number from Message		Y
	Message Status		Y
	Message Unread		Y
	Settable Message Center Number, Reply Path and Validity		Y
	Visible and Audible Message Receive		Y (No for Audible)
	Voice Mail		Y
	Settable Voice Mail Center Number		Y

	Message Protocol	Normal, Fax, National Paging, X400, ERMES, Voice	Y
	Message Overflow Indicator		Y
	Message Center Number		Y
	Nokia Smart Message		N
Miscellaneous Function	Development & Test Facility		Y
	Field Test Facility		Y
	Display Software Version		Y
	IMEI		Y
	Restore Factory Setting		Y
	Battery Charging Mode		Y
Text Input	Language	Selectable Auto Language	Y
	Predictive word input	T9	Y
Scheduler	Calendar	MAX: 20 records (18 chars)	Y
	To Do		N
	Memo	MAX: 10 records (80 chars)	Y
World Time	Setting Local Time		Y
	Display Two Number of Cities Time	Dual Clock	N
	Daylight saving		N
	NITZ		Y
Unit converter		Length, Weight, Volume, Surface,	Y

		Velocity, Temperature, User-defined	
Stop Watch			Y
Calculator		+ - * /	Y
PC Sync	Phone Book Sync	Only For service Center	Y
	Message Sync		N
Game		Will use Ruby's Game, 1 game	Y
Security	Emergency Call		Y
	Handset Lock		Y
	Security Code	When Delete All	Y
	SIM Lock		Y
	Keypad Lock		Y
Real Time Clock	12/24 Hour		Y
	Calendar		Y
	Time Zone		Y
	Daylight saving		Y
	Alarm Manager		Y
	Dimming Clock		N
	Power-off Alarm		Y
	On Alarm Event		Y
Others	Mobile Tracking software	For India, Asia	Y
	M-DOG	For China	Y
Accessory	microSD Adapter		Y
	Stereo earmic (without hook switch)		Y
User Memory		Min: 1 MB	Y

3.1.1 Overview of X-GOLDTM102

The X-GOLDTM102 is a GSM baseband modem including RF transceiver covering the low bands GSM850 / GSM900 and high bands GSM1800 / GSM1900 bands. X-GOLDTM102 is Dual Band, therefore, it supports by default a low / high pair of bands at the same time:

1. GSM850 / GSM1800
2. GSM850 / GSM1900
3. GSM900 / GSM1800
4. GSM900 / GSM1900.

The X-GOLDTM102 is optimized for voice-centric Mobile Phone applications.

The X-GOLDTM102 is designed as a single chip solution that integrates the digital, mixed-signal, RF functionality and a direct-to-battery Power Management Unit.

The transceiver consists of:

- Constant gain direct conversion receiver with an analog I/Q baseband interface
- Fully integrated Sigma/Delta-synthesizer capability
- Fully integrated two-band RF oscillator
- Two-band digital GMSK modulator with digital TX interface
- Digitally controlled crystal oscillator generating system clocks.

The X-GOLDTM102 supports a direct to battery connection, hence eliminating the need for an external Power Management Unit. The X-GOLDTM102 has different power down modes and an integrated power up sequencer.

The X-GOLDTM102 is powered by the C166@S-V2 MCU and TEAKLite® DSP cores. The operating temperature range from -30°C to 85°C. It is manufactured using the 0.13 µm CMOS process.

3.1.2 Features

Baseband

- High performance fixed-point TEAKlite DSP
- C166S-V2 high performance microcontroller with a 16KB Instruction Cache and a Data cache Buffer.
- There are several Interfaces:
 - I2S interface for DAI connections (for Tape Approval) and external Audio component connection.
 - High Speed SSC Interface for connection of companion chips (like Serial SD Cards)
 - High Speed SSC Interface dedicated to Display control
 - USIM Interface with support of Protocol T=1
 - Keypad Interface (6x4 or 5x5 keys)
 - EBU for external RAM/NOR FLASH/Busrt Flash/NAND Flash/Parallel Display connection
 - Asynchronous serial interface.
 - Asynchronous serial interface for WLAN/BT/GPS control (incl. IrDA support capability) .
 - JTAG Interface, OCDS, Multi-Core Debug and Real Time Trace facilities.
 - Black & white and color displays are supported

- PWM source to drive vibrator
- Keypad and display backlight supported.
- HASH Unit support for hashing.

Receiver

- Constant gain, direct conversion receiver with fully integrated blocking filter
- Two integrated LNAs
- No need of interstage and IF filter
- Highly linear RF quadrature demodulator
- Programmable DC output level
- Very low power budget.
- GPRS (up to Class 10 type1)

Transmitter

- Digital Sigma-Delta modulator for GMSK modulation, typical -163.5 dBc/Hz @ 20 MHz
- Single ended outputs to PA, Pout = +3.5 dBm
- Very low power budget.

RF-Synthesizer

- $\Sigma\Delta$ Synthesizer for multi-slot operation
- Fast lock-in times ($< 150 \mu\text{s}$)
- Integrated loop filter
- RF Oscillator
- Fully integrated RF VCO.

Crystal Oscillator

- Fully digital controlled crystal oscillator core with a highly linear tuning characteristic.

Mixed Signal and Power Management Unit

- DC/DC boost for voltages up to 15 V for driving White or Blue LEDs
- 8-Ohm loud speaker driver (250/350 mW)
- 16-Ohm earpiece driver
- 32-Ohm headset driver
- Measurement interfaces (PA temperature, battery voltage, battery temperature, and ambient temperature)
- Accessory Detection
- PCB ID detection
- Differential microphone input
- System start up circuitry
- Charger circuitry for NiCd, NiMh and Lilon cells with integrated Control Current/Voltage Charging.
- Integrated regulators for direct connection to battery.

Package

X-GOLDTM102 utilizes an PG-VF2BGA-189-1 lead-free (green) package. The high degree of integration in

X-GOLDTM102 in conjunction with a sophisticated designed ball-out allows building a complete

mobile phone with
all its peripherals on a 4-layer PCB.

3.1.3 System Platform Application

X-GOLDTM102 was developed for very low cost Dual Band GSM/GPRS system solutions. Here are some potential System Platform configurations that can be built with X-GOLDTM102 Solution:

Platform usecases	Memory	WLAN	BT	Serial SD-CARD	Serial SD-Card	
	Configuration	Behind AD Pins	Behind AD Pins	Behind AD Pins	Behind USIM (time-sharing)	GPS
Platform-1	MUX memories	x	x			x
Platform-2	MUX memories		x	x		x
Platform-3	DEMUX memories				x	x

egoldvoice2_application-table.vsd

3.1.4 GSM System Description

The X-GOLDTM102 is suited for mobile stations operating in the GSM850/900/1800/1900 bands. In the receiver path the antenna input signal is converted to the baseband, filtered, and then amplified to target

level by the RF transceiver chip set. Two A-to-D converters generate two 6.5 Mbit/s data streams.

The decimation

and narrowband channel filtering is done by a digital baseband filter in each path. The DSP performs:

1. The GMSK equalization of the received baseband signal (SAIC support available)
2. Viterbi channel decoding supported by an hardware accelerator.

The recovered digital speech data is fed into the speech decoder. The X-GOLDTM102 supports fullrate, halfrate,

enhanced fullrate and adaptive multirate speech CODEC algorithms.

The generated voice signal passes through a digital voiceband filter. The resulting 4 Mbit/s data stream is D-to-A

converted by a multi-bit-oversampling converter, postfiltered, and then amplified by a programmable gain stage.

The output buffer can drive a handset ear-piece or an external audio amplifier, an additional output driver for

external loud speaker is implemented.

In the transmit direction the differential microphone signal is fed into a programmable gain amplifier.

The prefiltered

and A-to-D converted voice signal forms a 2 Mbit/s data stream. The oversampled voice signal

passes a digital

decimation filter.

The X-GOLDTM102 performs speech and channel encoding (including voice activity detection (VAD) and discontinuous transmission (DTX)) and digital GMSK modulation. In the RF transceiver part, the baseband signal modulates the RF carrier at the desired frequency in the 850 MHz, 900 MHz, 1.8 GHz, and 1.9 GHz bands using an I/Q modulator. The X-GOLDTM102 supports dual band applications. Finally, an RF power module amplifies the RF transmit signal at the required power level. Using software, the X-GOLDTM102 controls the gain of the power amplifier by predefined ramping curves (16 words, 11 bits).

For baseband operation, the X-GOLDTM102 supports:

- High Speed Circuit Switched Data (HSCSD) class 4
- Packet-oriented data (GPRS) class 4 with a coding scheme from 1 to 4. It provides fixed, dynamic, and extended dynamic modes.

If the X-GOLDTM102 is only used as a modem, then it supports:

- High Speed Circuit Switched Data (HSCSD) class 10
- Packet-oriented data (GPRS) class 10 with coding schemes from 1 to 4. It provides fixed, dynamic, and extended dynamic modes.

The X-GOLDTM102 can support Class B operation. The mobile phone can be attached to both GPRS and GSM services (one service at a time). During a GPRS connection Class B enables either:

- Making or receiving a voice call
- Sending or receiving an SMS.

During voice calls or SMS, GPRS services are suspended and then resumed automatically after the call or SMS session has ended.

3.1.5 Bus Concept

The X-GOLDTM102 has two cores (a microcontroller and a DSP), each with its own bus.

There is an Shared memory interconnection between the TEAKlite bus and the C166S-V2 X-Bus.

C166S-V2 Buses

The C166S-V2 is connected to four buses:

1. IMB (Internal Program) bus
2. DPML (Data-Program) Bus
3. X-Bus
4. PD-Bus.

TEAKlite Bus

The TEAKlite is connected to the TEAKlite bus.

Bus Interconnections

The interconnection between the X-Bus and the TEAKlite Bus uses:

- Multicore Synchronization
- Shared Memory.

3.1.6 Clock Concept

The X-GOLDTM102 has a flexible clock control.

3.1.7 Interrupt Concept

The C166 MCU carries out the X-GOLDTM102 interrupt system.

3.1.8 Debug Concept

The X-GOLDTM102 includes a multi-core debug. The C166 and TEAKlite cores can be debugged in parallel with:

- A single JTAG port (that is, on a single host)
- Mutual breakpoint control.

C166 Debug Concept

The debugging of the C166 uses the OCDS and the Cerberus.

The X-GOLDTM102 also includes a Real Time Trace module for software debugging.

TEAKlite Debug Concept

TEAKlite debugging uses the OCEM and the SEIB.

3.1.9 Power Management

The X-GOLDTM102 provides the power management unit (PMU) for the complete mobile phone application. The integrated PMU is directly connected to the battery and provides a set of linear voltage regulators (LDO's). These LDO's generate all required supply voltages and currents needed in a low feature mobile phone.

The charger unit controls the charging of NiCd, NiMh, LiPolymer and LiON batteries. Only a few external parts are required to support charging from a DC wall adaptor. In addition, the charger generates the power-on reset after battery insertion or charger connection. The supported battery voltage range is 3.1 to 5.1 V for NiCd/NiMH and 3.1 to 4.6 V for LiPolymer and LiON batteries. The upper voltage limit is programmable. The charger supports constant current precharging, full-charging (pulsed charging) and software controlled constant current charging. The charging functions are protected by hardware timer. Charger idle voltages up to 20 V can be handled. An integrated overvoltage protection protects batteries and system against overvoltage.

White/blue backlight generation is supported with a special driver for very a low external parts count. Power consumption during operation phases is minimized due to flexible clock switching

In the Standby Mode most parts of the device are switched off, only a small part is running at 32kHz and the controller RAM is switched to a power saving mode. The TEAKlite ROM can be switched off during Standby via SW.

This Units (associated to the Measurement Unit) provides also support for a accessory detection .

3.1.10 On-Chip Security Concept

Secure boot is based on a public/private key approach. Flash images that are not signed with the private key during phone manufacture cannot be loaded. Verification of the Flash code is done with the public key. The public key as well as hash and verify algorithms are stored in the ROM, which ensures a hardware secured boot procedure.

The following security features are supported:

- Prevention of illegal Flash programming
- Flash programming makes use of the X-GOLDTM102 ID for personalization checks with IMEI and SIM-lock protection

The security features use the following mechanism:

- Boot ROM flow:
 - Controls the boot transition to external flash
 - Controls the flash update
- Flash tied to the individual chip via an ID using e-fuses, that is, each X-GOLDTM102 chip has its own fused ID.
- Hardware support of SHA1 algorithm to reduce the booting time.

Further details on the X-GOLDTM102 security concept are not publicly documented.

GSM Cipher Unit

This unit on the TEAKlite bus calculates the GSM/EDGE encryption keystream and the GSM/EDGE decryption keystream. It implements the following algorithms: A5/1, A5/2, and A5/3.

3.1.11 Asynchronous Operation Mode Concept

The X-GOLDTM102 can operate in either:

- The traditional synchronous mode with the 26 MHz system clock synchronized on the base station
- A special asynchronous mode (XO concept).

In the asynchronous mode the 26 MHz clock input is not synchronized with the base station; the residual frequency offset is compensated in the digital signal processing domain. This processing includes frequency and timing compensation of the baseband and voiceband signals.

3.2 Memory chip (S71GL064NA0BFW0Z0)

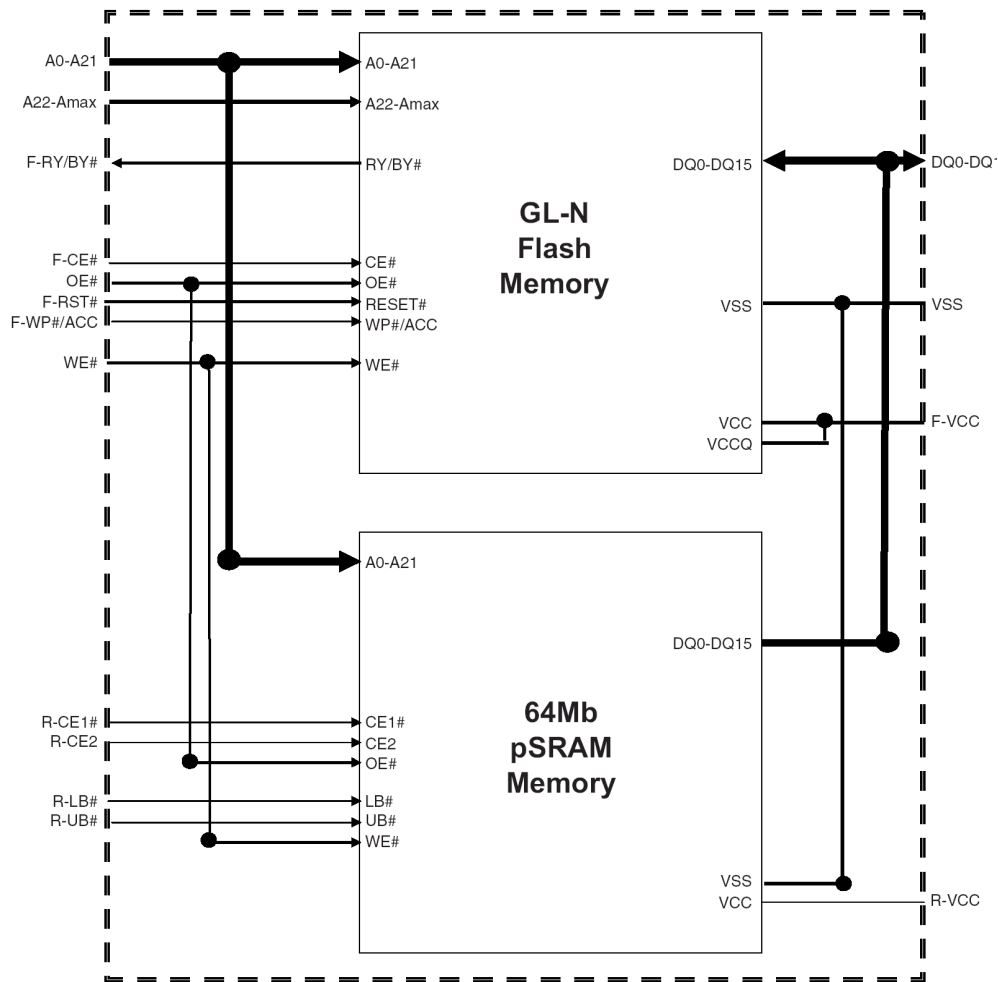


Figure.3-2 S71GL064NA0BFW0Z0 FUNCTIONAL BLOCK DIAGRAM

Features

- _ Power supply voltage of 2.7 to 3.1V
- _ 100 ns access time (S71GL128N)
- _ 105 ns access time (S71GL512N)
- _ 25 ns page read times
- _ Packages:
 - 12.0 x 9.0 mm x 1.2 mm FBGA (TLD084) (S71GL512N)
 - 11.6 x 8.0 mm x 1.2 mm FBGA (TLA084) (S71GL128N)
- _ Operating Temperature
 - -25 °C to +85 °C (Wireless)

General Description

The S71GL Series is a product line of stacked Multi-chip Product (MCP) packages and consists of

- _ One Flash memory die
- _ One pSRAM

3.3 Power Amplifier Module (SKY77518)

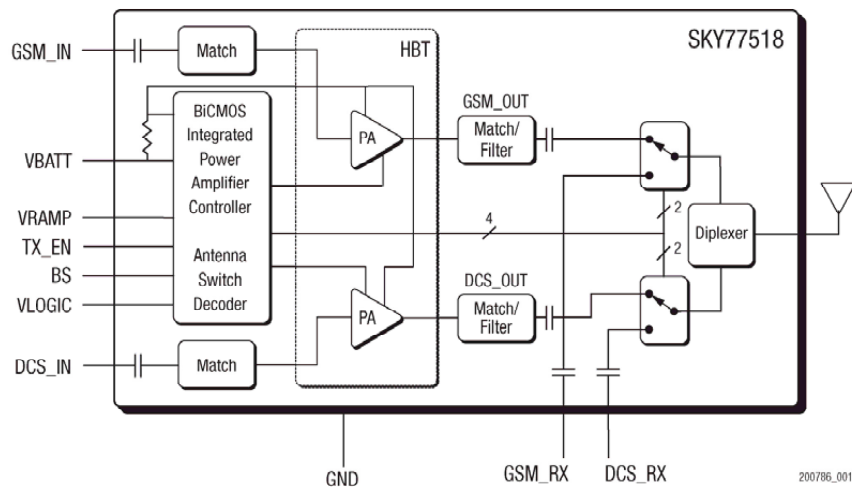


Figure.3-3 SKY77518 FUNCTIONAL BLOCK DIAGRAM

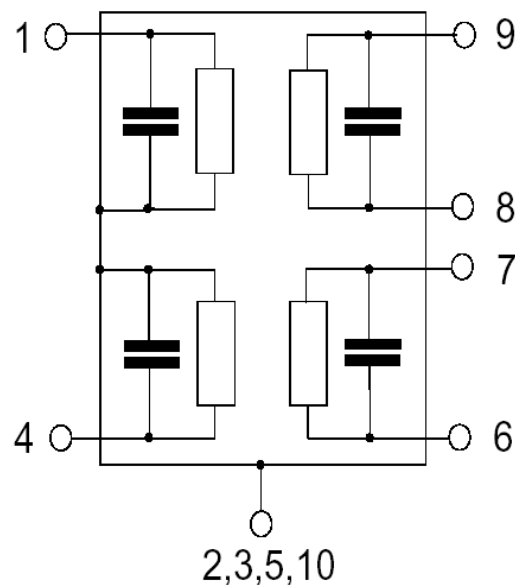
The SKY77518-21 is a transmit and receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC™) for dual-band cellular handsets comprising GSM900 and DCS1800 operation. Designed in a low profile, compact form factor, the SKY77518-21 offers a complete Transmit VCO-to-Antenna and Antenna-to-Receive SAW filter solution. The FEM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of a GSM900 PA block and a DCS1800 PA block, impedance-matching circuitry for 50 Ω input and output impedances, TX harmonics filtering, high linearity and low insertion loss PHEMT RF switches, diplexer and a Power Amplifier Control (PAC) block with internal current sense resistor. A custom BiCMOS integrated circuit provides the internal PAC function and decoder circuitry to control the RF switches. The two Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM900 band and the other PA block supports the DCS1800 band. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the two receive pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The GaAs die, PHEMT die, Silicon (Si) die and passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

Band selection and control of transmit and receive modes are performed using two external control pads. Refer to the functional block diagram in Figure.3-2-1 below. The band select pad (BS) selects between GSM and DCS modes of operation. The transmit enable (TX_EN) pad controls receive or transmit mode of the respective RF switch (TX = logic 1). Proper timing between transmit enable (TX_EN) and Analog Power Control (VRAMP) allows for high isolation between the antenna and TXVCO while the VCO is being tuned prior to the transmit burst.

The SKY77518-21 is compatible with logic levels from 1.2 V to VCC for BS and TX_EN pads, depending on the level applied to the VLOGIC pad. This feature provides additional flexibility for the designer in the selection of FEM interface control logic.

3.4 RF SAW (B9308)



Application

Low-loss 2in1 RF filter for mobile telephone GSM 900 and GSM 1800 systems, receive path (Rx)

Usable passband:

Filter 1 (GSM 1800): 75 MHz

Filter 2 (GSM 900): 35 MHz

Unbalanced to balanced operation for both filters

Very low insertion attenuation

Low amplitude ripple

Impedance transformation from 50 W to 150 W for both filters

Suitable for GPRS class 1 to 12

Features

Package size 2.0 x 1.6 x 0.68 mm³

Package code QCS10H

RoHS compatible

Approx. weight 0.008 g

Package for Surface Mount Technology (SMT)

Ni, gold-plated terminals

Electrostatic Sensitive Device (ESD)

Pin configuration

1 Input [Filter 1]

4 Input [Filter 2]

6,7 Output, balanced [Filter 2]

8,9 Output, balanced [Filter 1]

2,3,5,10 Case-ground

3.5 Audio Amplifier (TPA6205A1)

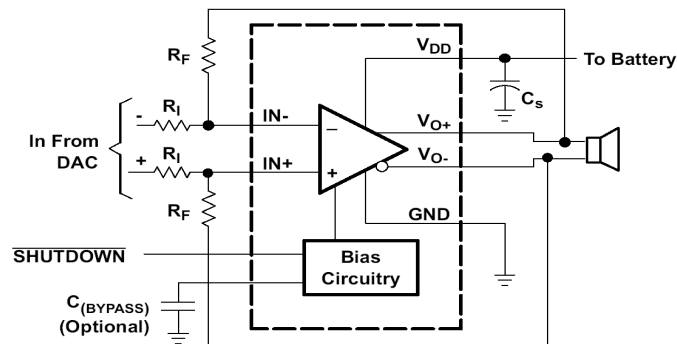


Figure.3-5 TPA6205A1 FUNCTIONAL BLOCK DIAGRAM

FEATURES

- 1.25 W Into 8W From a 5-V Supply at THD = 1% (Typical)
- Compatible with Low Power (1.8V Logic) I/O
- Shutdown Pin has 1.8V Compatible Threshold
- Low Supply Current: 1.7mA Typical
- Shutdown Current < 10mA
- Only Five External Components
 - Improved PSRR (90 dB) and Wide Supply Voltage (2.5V to 5.5V) for Direct Battery Operation
 - Fully Differential Design Reduces RF Rectification
 - Improved CMRR Eliminates Two Input Coupling Capacitors
 - C(BYPASS) Is Optional Due to Fully Differential Design and High PSRR
- Available in 3 mm x 3 mm QFN Package(DRB)
- Available in an 8-Pin PowerPAD™ MSOP(DGN)
- Available in a 2 mm x 2 mm MicroStar Junior™ BGA Package (ZQV)

APPLICATIONS

- Designed for Wireless Handsets, PDAs, and other mobile devices
- Compatible with Low Power (1.8V Logic) I/O Threshold control signals

DESCRIPTION

The TPA6205A1 is a 1.25-W mono fully differential amplifier designed to drive a speaker with at least 8-W impedance while consuming less than 37 mm² (ZQV package option) total printed-circuit board (PCB) area in most applications. This device operates from 2.5 V to 5.5 V, drawing only 1.7 mA of quiescent supply current. The TPA6205A1 is available in the space-saving 2 mm x 2 mm MicroStar Junior™ BGA package, and the space saving 3 mm x 3 mm QFN (DRB) package. Features like 85-dB PSRR from 90 Hz to 5 kHz, improved RF-rectification immunity, and small PCB area makes the TPA6205A1 ideal for wireless handsets. A fast start-up time of 4 ms with minimal pop makes the TPA6205A1 ideal for PDA applications.

3.6 Charger IC (MP26021)

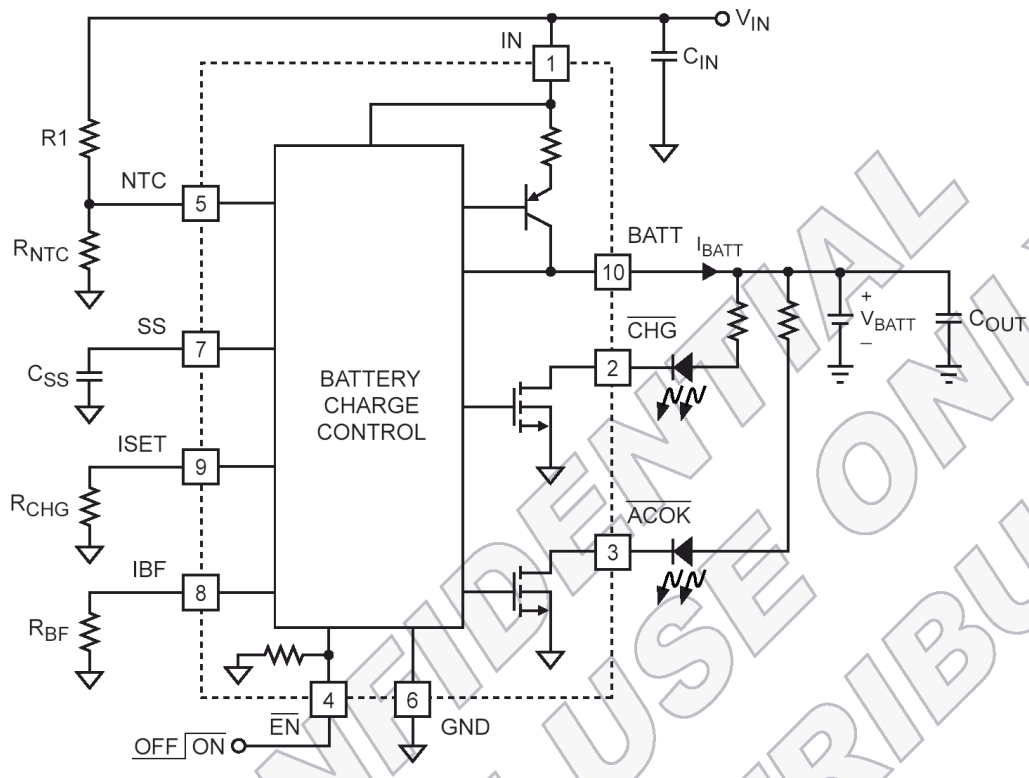


Figure.3-6 MP26021 FUNCTIONAL BLOCK DIAGRAM

DESCRIPTION

The MP26021 is a linear, high-performance single cell Li-Ion battery charger. By integrating high voltage input protection into the charger IC, the MP26021 can tolerate an input surge up to 28V.

The device features constant current (CC) and constant voltage (CV) charging modes with programmable charge currents (85mA to 1A), programmable battery full threshold, thermal protection, battery temperature monitoring, reverse current blocking and trickle charge. The device also provides AC adapter power good and charge status indications to the system.

MP26021 is available in a 10-pin 3mm x 3mm QFN package.

FEATURES

- Input Surge Up to 28V
- Adapter or USB Input
- Programmable Charge Current: 85mA to 1A
- Proprietary Constant Voltage Auto Recharge
- Proprietary Over-Voltage Protection
- 0.75% VBATT Accuracy
- <1μA Battery Reverse Current
- 90μA Standby Current from VIN

- Battery Temperature Monitoring
- Over Current Protection
- AC Adapter Power Good Indicator
- Charge Status Indicator
- Programmable Soft-Start
- Programmable Charge Termination Current Threshold
- Tiny 10-Pin QFN (3mm x 3mm) Package

APPLICATIONS

- Cell Phones
- MP3 Players
- Smart Phones
- PDAs
- Digital Cameras

3.7 Camera Driver (AIT701A)

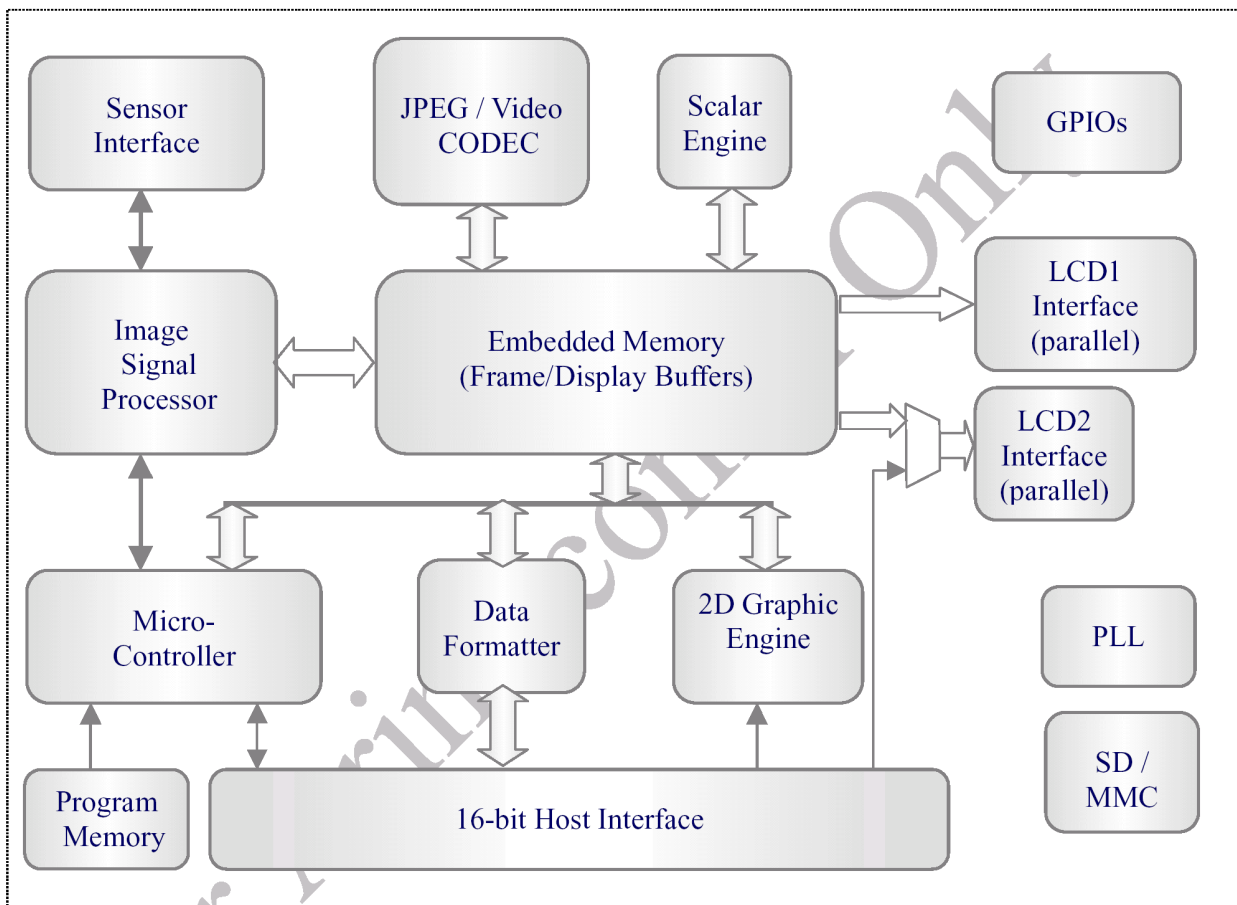


Figure.3-7 AIT701A FUNCTIONAL BLOCK DIAGRAM

3.7.1. General Descriptions

The AIT701A is a highly integrated versatile multi-media processor for image-enabled mobile and handheld devices, such as cellular phones and PDAs. The AIT701A includes an 8-bit micro-controller, frame/display memory, high-quality image processor, real-time JPEG CODEC, video processor, 2D-Graphic Engine and LCD Display Interface.

The on-chip image processor implements the most advanced algorithm to deliver professional-grade image quality, which also supports versatile features of digital still camera like AE(Auto Exposure), AWB(Auto White Balance), Digital Zoom and a variety of image special effects. The maximum resolution supported by AIT701A is 300K–pixel.

The on-chip JPEG CODEC is compliant with the JPEG baseline standard (ISO/IEC 10918) and JFIF formats, which performs real-time compression and decompression at the rate of 30 frame per second with VGA resolution. The image size could be dynamically adjusted by easily programming the internal registers.

The LCD Display Interface of AIT701A supports dual displays that can be TFT, TFD, LTPS, or Color-STN LCD panels. The AIT701A could support a wide range of resolutions of LCD panels up

to 128*160.

The AIT701A, powered by Alpha Imaging Technology, will provide complete development environment for customer to shorten the design cycle and “Time-to-Market”.

Applications

- MMS-enabled Cellular Phones
- Smart Phones
- PDA's

3.7.2 Features

On-Chip Advance Image Processor

Max. Image Resolution: 640(H) * 480(V)

Generic Sensor Interface supports:

- VGA CMOS / CCD sensors

Supports Multi-operating modes:

- Still (Capture) JPEG picture for MMS
- Real time preview (up to 30f/s) on the phone display
- H263/3GPP Video clip for MMS

Embedded Buffers for Image frame and Display buffer. No external memory required.

Built-in real-time JPEG Compression/Decompression Engine:

- Compliant with JPEG baseline standard (ISO/IEC 10918) with JFIF.
- Hardware JPEG engine does 30 frame per second @VGA resolution
- Supports YUV 422/420 encoder format
- Supports YUV 444/422/420/411 decoder format
- Adjustable image size
- Programmable compression rate for adjustable picture file size

Hardware Color DSP for Image Processing:

- Interpolation (Demosaic)
- Color space conversion
- Gamma table
- Edge Enhancement
- Anti-crosstalk
- Anti-flare
- Brightness/Contrast enhancement
- Hue/Saturation enhancement
- Auto-White-Balance
- Auto-Exposure
- Auto Focus support
- Calibrated and Automatic Defect Pixel Compensation
- Black Level Compensation

- Lens shading correction
- Non-linear color process for sensor input
- Dithering for low bit resolution LCD panel
- 2D filtering to reduce jaggy
- Special image effects (for both preview and store): Sepia / B&W / Emboss / Negative / Sketch / Oil / Crayon / BlackBoard / WhiteBoard
- Noise Reduction
- Space Color non-Uniformity Compensation
- False Color Reduction
- Histogram analysis to enhance dynamic range
- Supports Real Digital Zoom up to 4x. (Linear Zoom with fine steps)
- Supports infinite number of multi-shots (up to 6 shots per second at QVGA resolution)
- Support Flash Strobe function

LCD Controller

- On-chip LCD Controller supports:
 - Dual panels: main and sub
 - “RAM-integrated” TFT and Color STN LCDs
 - Graphic mode OSD
 - Picture-in-Picture
 - Image rotation 90/180/270 degree, and Mirror display
- Max. Display Resolution: 128*160 with 260K color
- Overlay effects for display such as Photo frame, Sticker image, OSD superimpose, transparent/semi-transparent effects, etc.

2D Graphic Engine

- Hardware 2D graphic engine supports:
 - BitBLT
 - Line draw
 - Color expansion
 - Sixteen commonly used ROPs (Raster Operation)
 - Pattern/solid fill
 - Transparent overlay
 - Hardware cursor
 - Image rotate
- Overlay effects for saved pictures such as Photo frame, Sticker image, transparent effects, etc.

Other Functions

- Embedded 8-bit micro controller for UI control.
- Generic 16-bit Host Interfaces to System Bus
- Support SD/MMC memory card
- GPIOs available for user definition

On-chip Programmable PLL Circuits

Supports Smart Power Down mode

Power Supply

1.8 Volts for Core

Seperated I/O voltages:

- 1.8~3.3 volts for Host CPU interface I/Os
- 1.8~3.3 volts for Sensor interface I/Os
- 1.8~3.3 volts for GPIOs and LCD interface I/Os
- 2.8~3.3 volts for PLL

Power consumption

TBD

Operating temperature : -30 ~ 70 degree Celsius

Packages

81-pin VFBGA (5mm * 5mm * 1.0mm)

3.8FM Radio (Si4703)

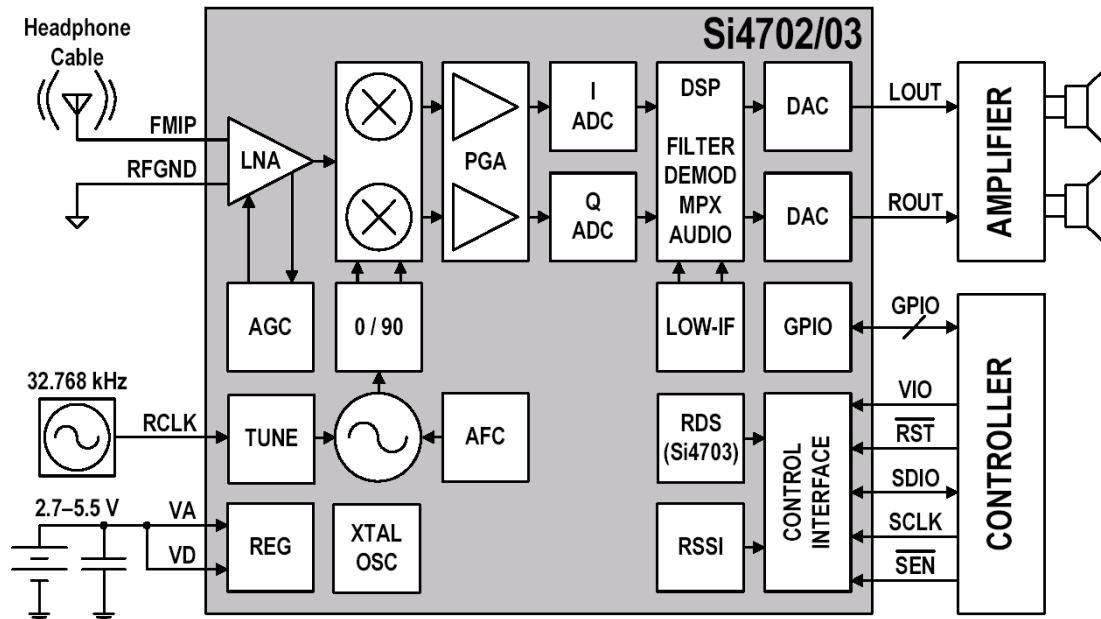


Figure.3-8 Si4703 FUNCTIONAL BLOCK DIAGRAM

Features

- This data sheet applies to Si4702/03 Firmware 15 and greater
- Worldwide FM band support (76–108 MHz)
- Digital low-IF receiver
- Frequency synthesizer with integrated VCO
- Seek tuning
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Excellent overload immunity
- Signal strength measurement
- Programmable de-emphasis (50/75 μ s)
- Adaptive noise suppression
- Volume control
- Line-level analog output
- 32.768 kHz reference clock
- 2-wire and 3-wire control interface
- 2.7 to 5.5 V supply voltage
- Integrated LDO regulator allows direct connection to battery
- 3 x 3 mm 20-pin QFN package
 - Lead-free/RoHS compliant
- RDS/RBDS Processor (Si4703)

Integrated crystal oscillator

Applications

Cellular handsets

MP3 players

Portable radios

USB FM radio

PDA's

Notebook PCs

Description

The Si4702/03 integrates the complete tuner function from antenna input to stereo audio output for FM broadcast radio reception.

3.9 LCD Interface

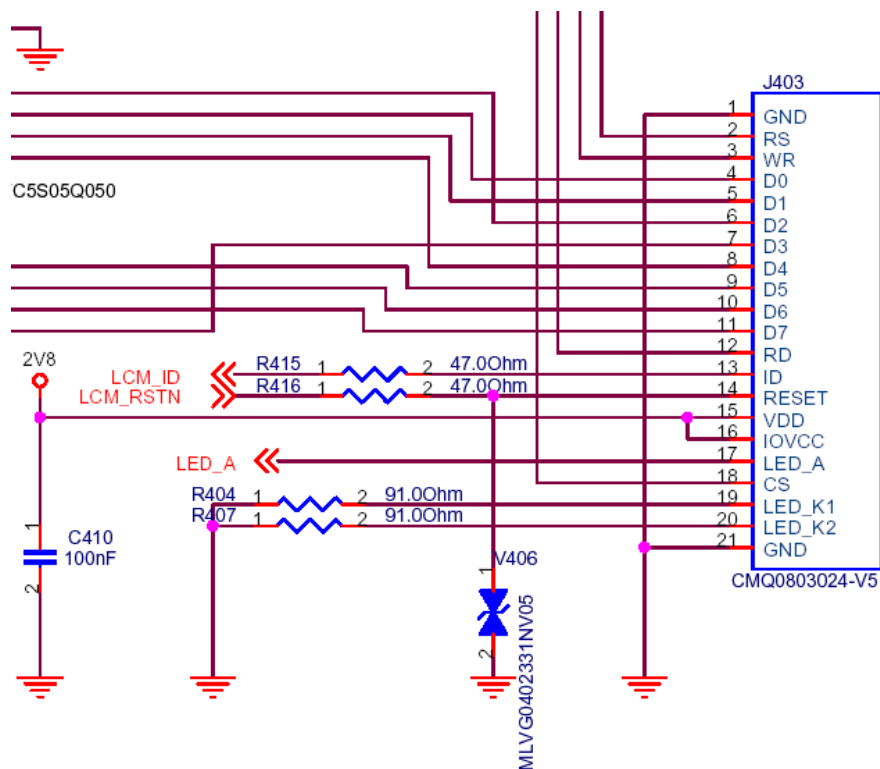


Figure.3-9-1 LCD Interface

CHARGING PUMP

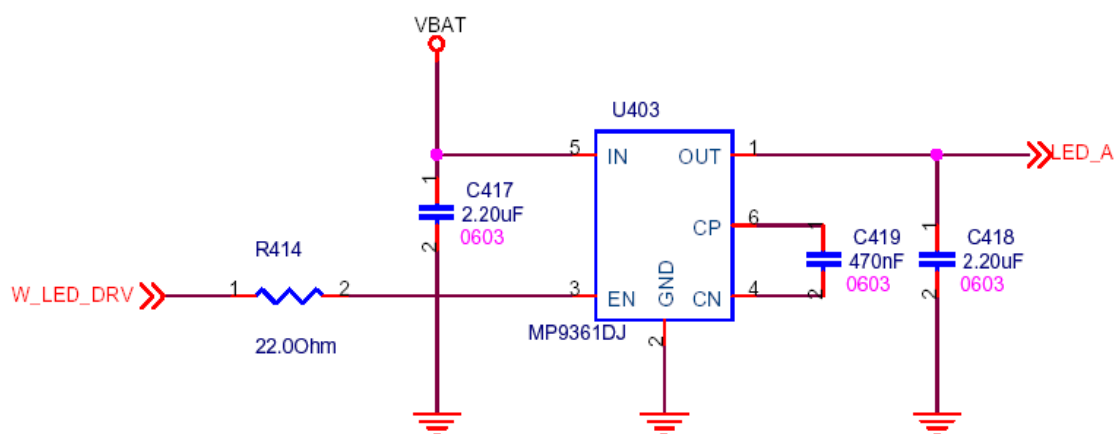


Figure.3-9-2 Charging PUMP Interface

LCD Interface Pin Function

Pin No.	Signal	Pin Function
1	GND	Ground
2	A0	Register select input pin
3	WR	Write enable clock input pin
4	D00	Data bus
5	D01	Data bus
6	D02	Data bus
7	D03	Data bus
8	D04	Data bus
9	D05	Data bus
10	D06	Data bus
11	D07	Data bus
12	RD	Read enable clock input pin
13	ID-Low	ID Pin = "L"
14	RESET	Reset input pin
15	VDDA	Power supply input for analog voltage (2.4V ~ 3.3)
16	VDDIO	Power supply input for digital voltage (1.65V ~ 3.0V)
17	LED_A	Power supply anode input for backlight (LED +)
18	CS	Chip select input pin
19	LED_K1	Power supply cathode input for backlight (LED –)
20	LED_K2	Power supply cathode input for backlight (LED –)
21	GND	Ground

Charging PUMP Pin Function

Pin #	Name	Description
1	OUT	Output Voltage. Decoupled with a 2.2μF ceramic capacitor for a load current less than 60mA. For a load current greater than 60mA, use 10μF decoupling capacitor.
2	GND	Ground.
3	EN	Device Enable: A logic high input ($V_{EN} > 1.5V$) turns on the regulator. A logic low input ($V_{EN} > 0.4V$)
4	CN	Flying Capacitor Negative Terminal.
5	IN	Input.
6	CP	Flying Capacitor Positive Terminal.

3.10 SIM Card Interface

SIM CONNECT

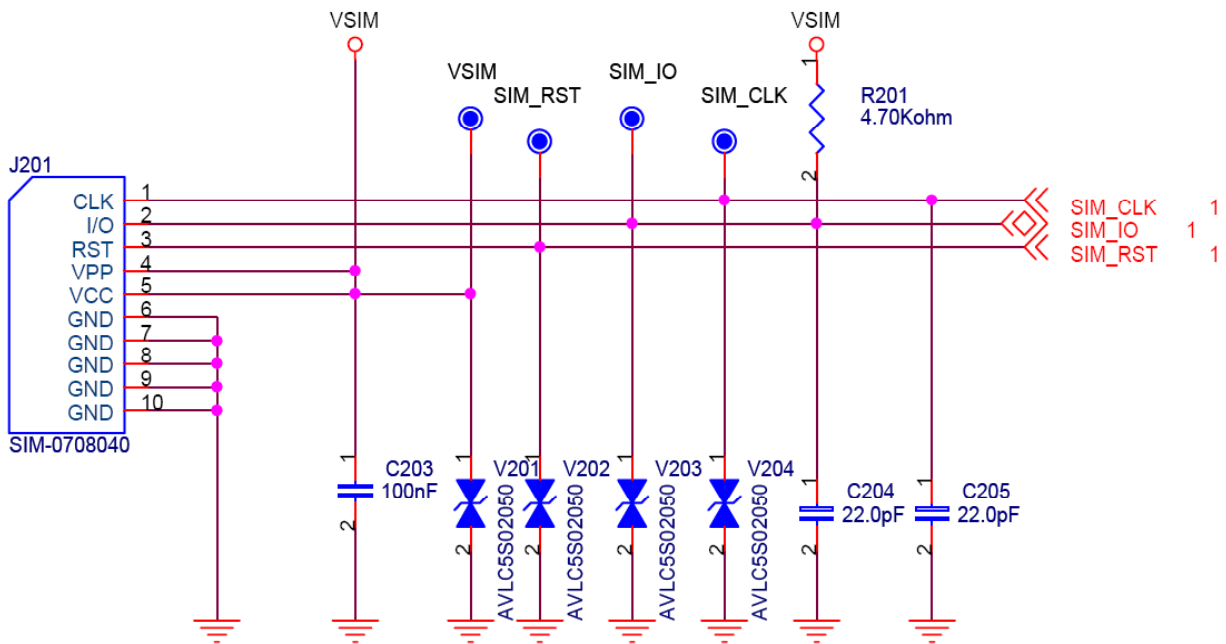


Figure.3-10 SIM CARD Interface

Signals	Description
SIM_RST	This signal makes SIM card to HW default status.
SIM_CLK	This signal is transferred to SIM card.
SIM_DATA	This signal is interface datum.

3.11 KEYPAD Interface

KEY PAD

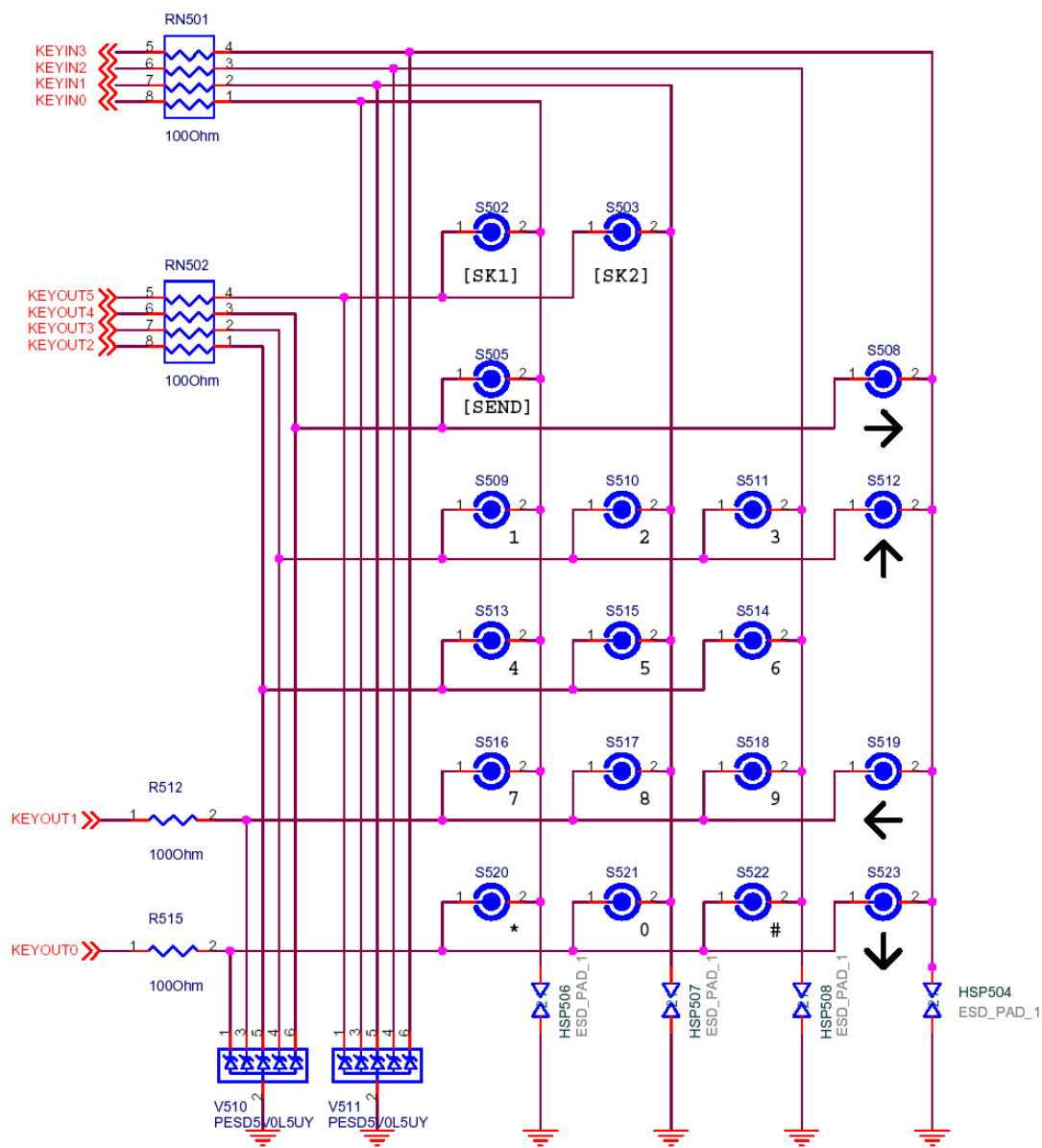


Figure.3-11 KEY PAD Interface

3.12 Key LED Interface

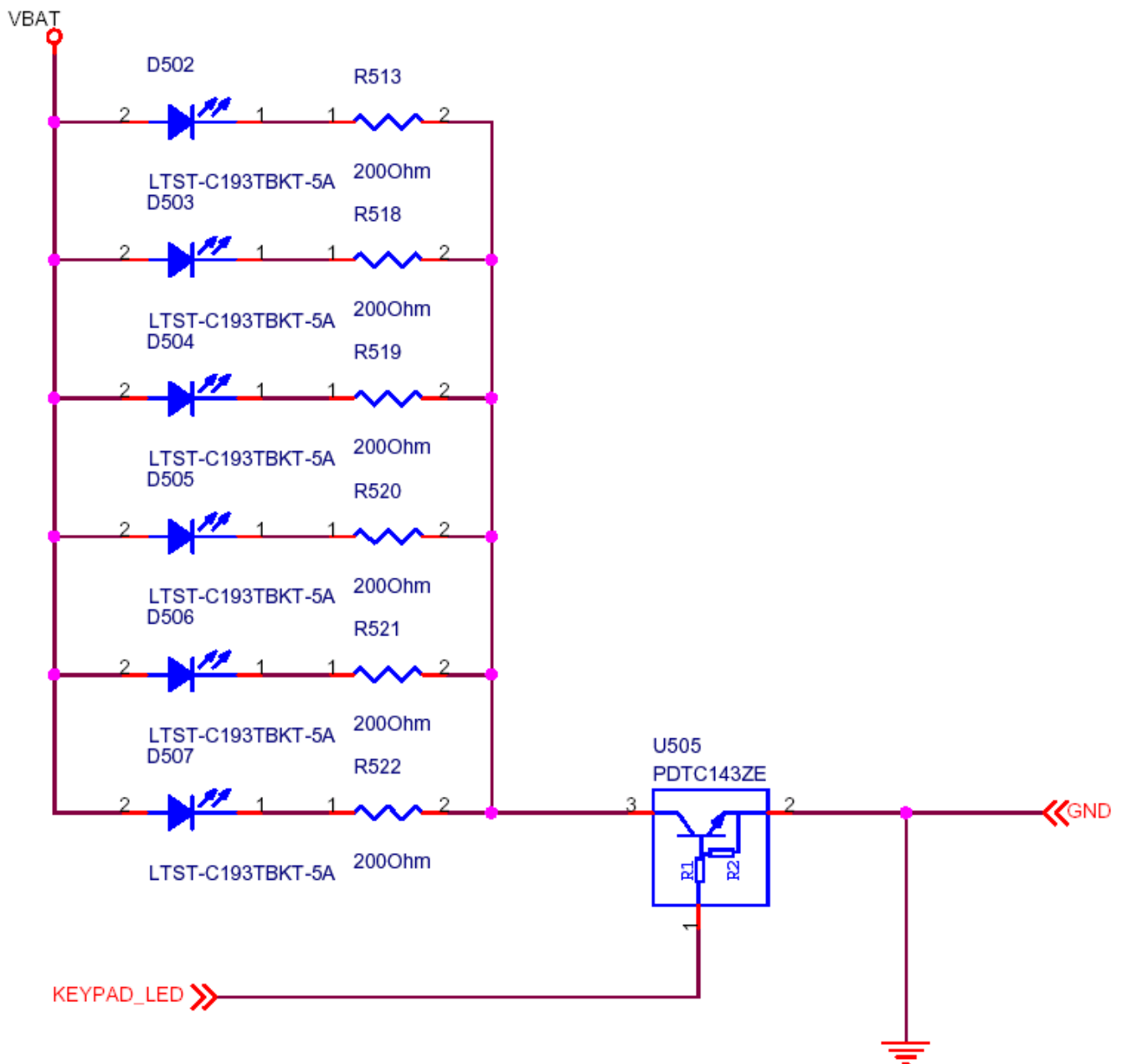


Figure.3-12 Key LED Interface

This handset has 6 LEDs that illuminates blue color.

Control signal is controlled by X-Gold102 with PWM and handset has 3 methods, ON, OFF, Dimming.

3.13 Vibrator Interface

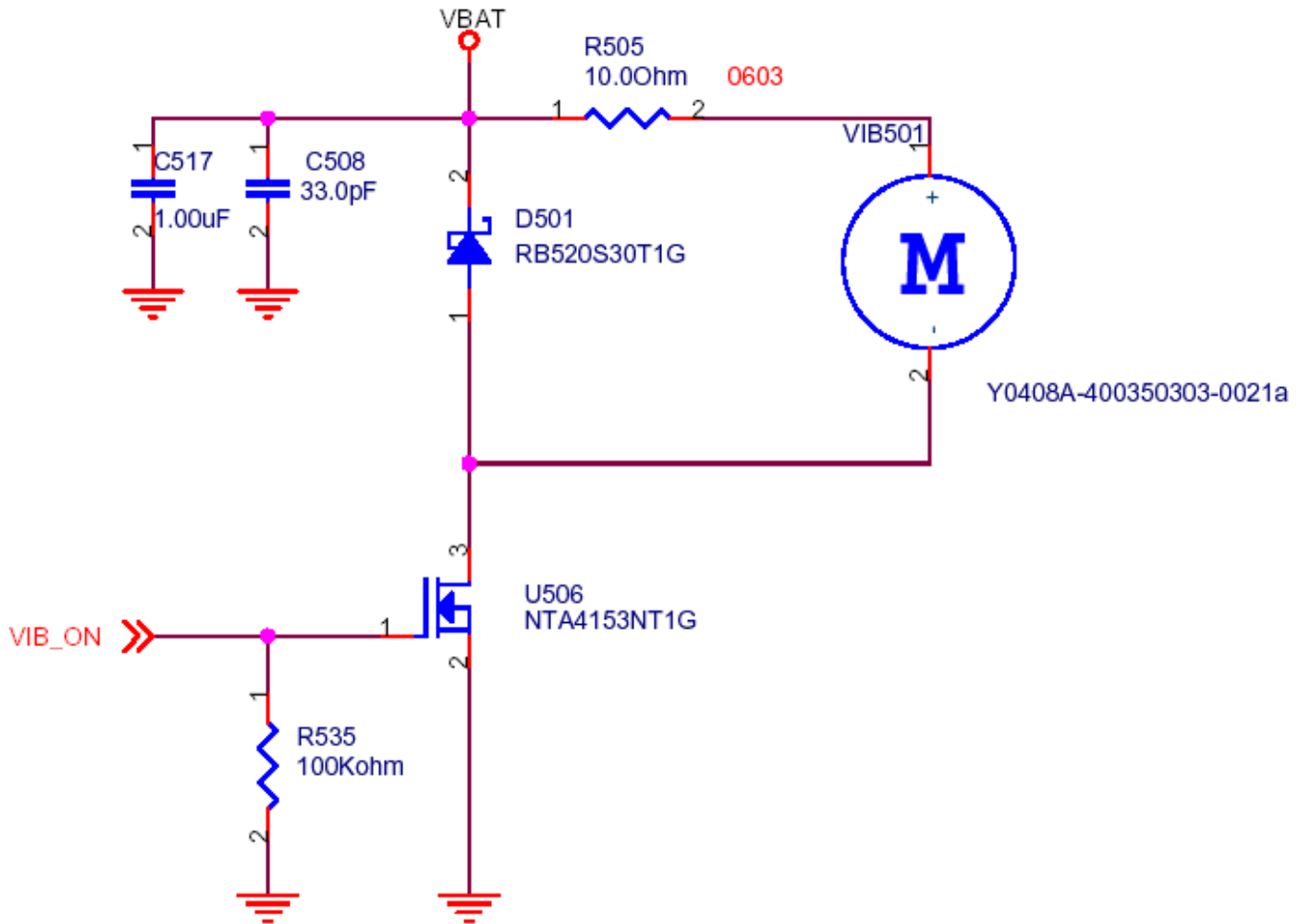
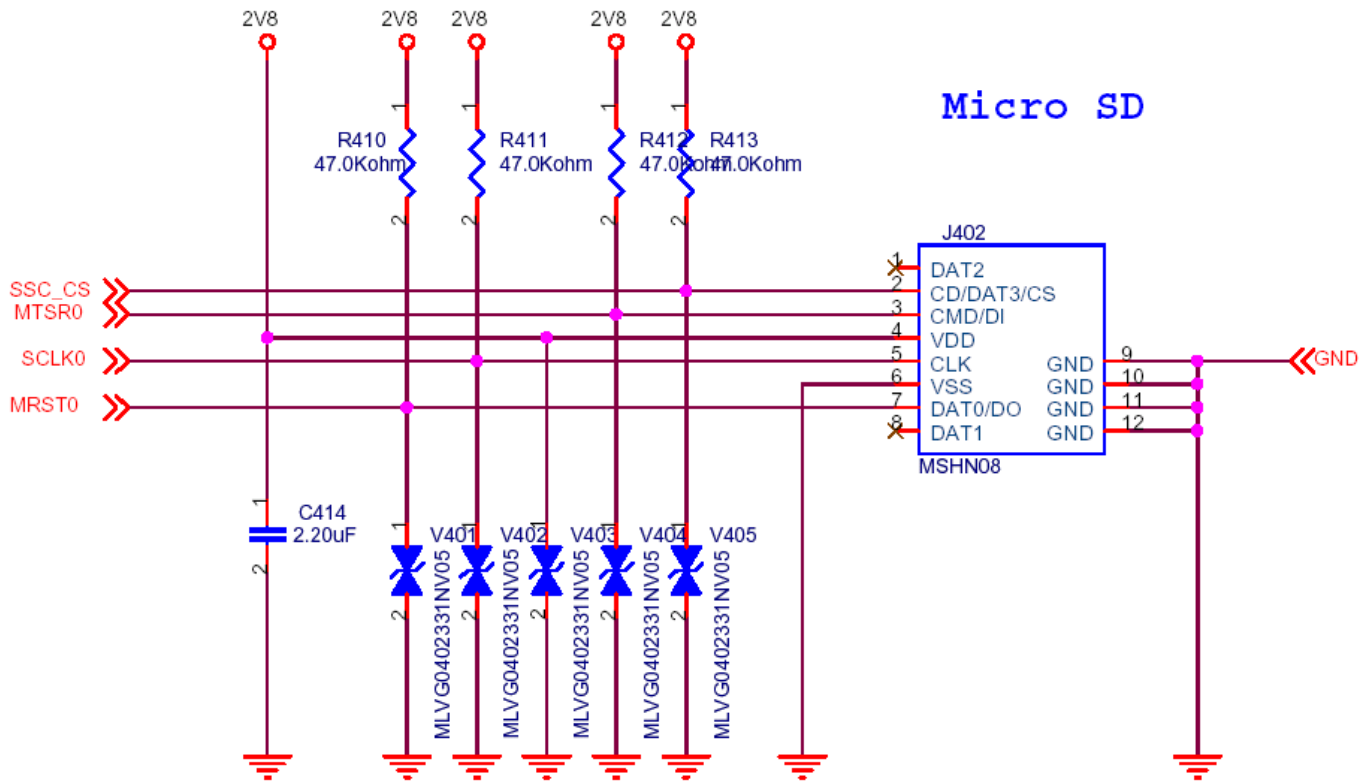


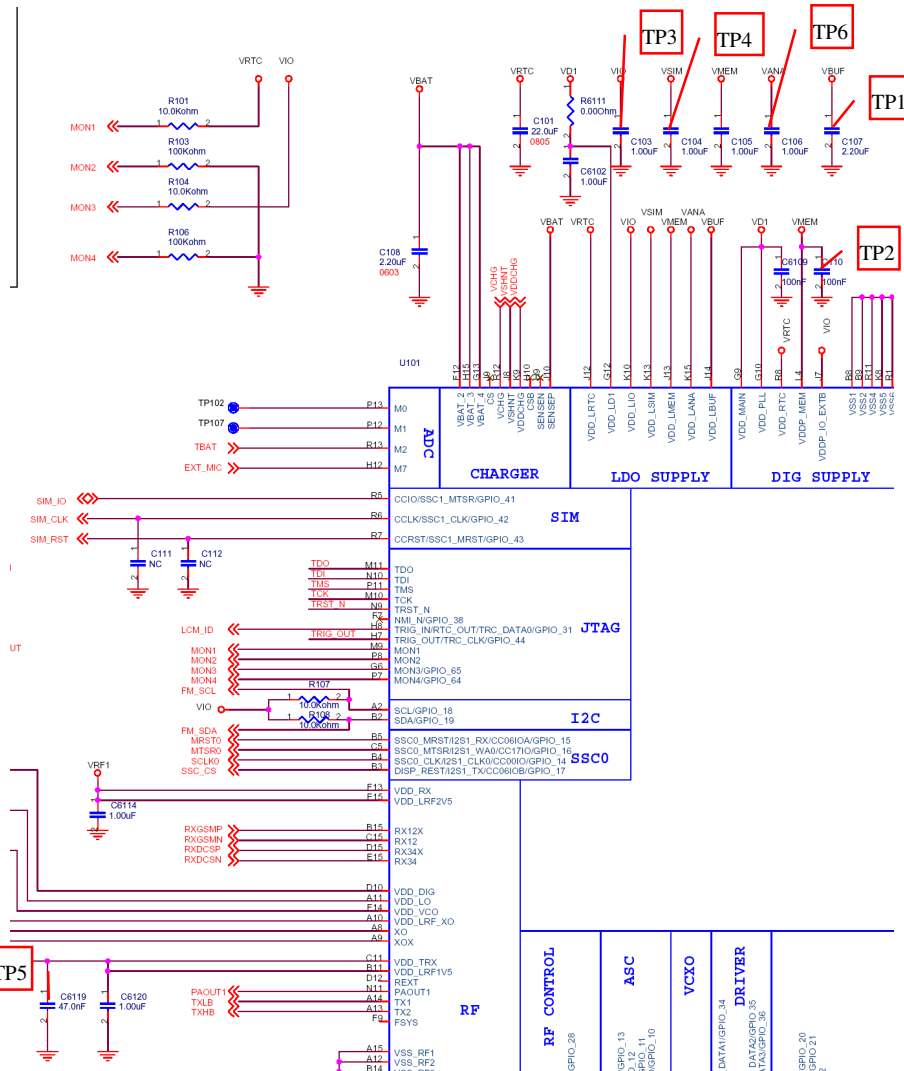
Figure.3-13 Vibrator Interface

This handset has Vibrator operation. Control signal is controlled by X-Gold102 with PWM.

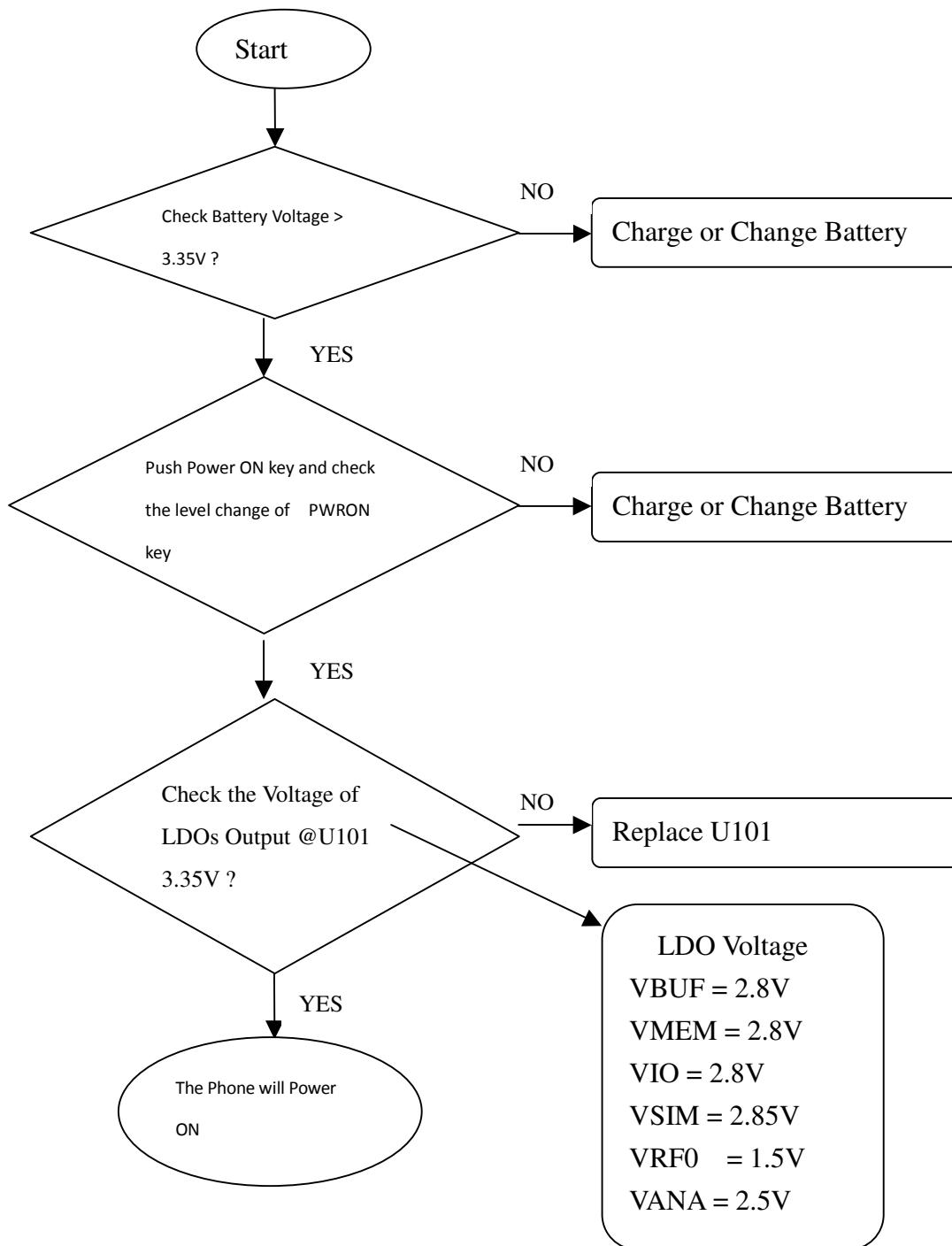
3.14 Micro SD Interface



Circuit Diagram

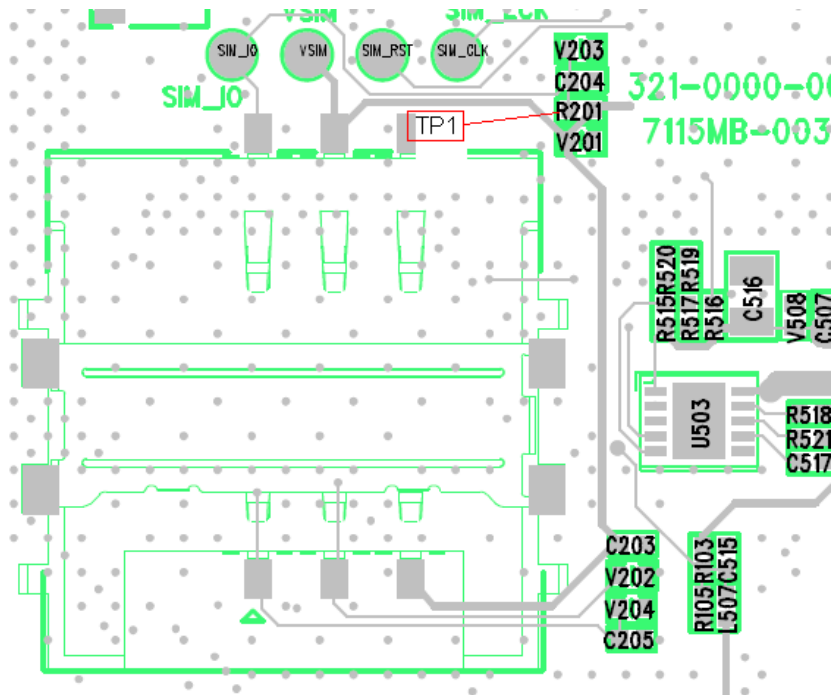


Checking Flow



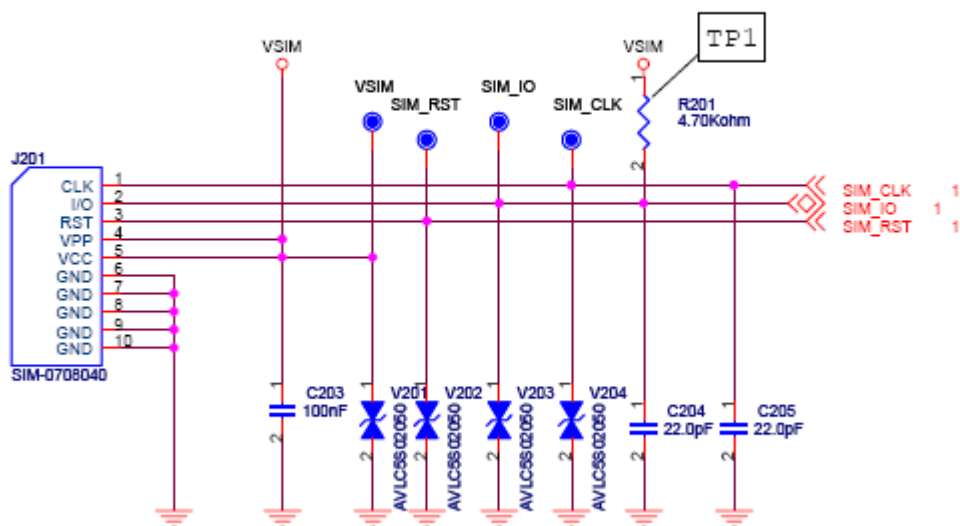
4.2 SIM Card Trouble

Test Point

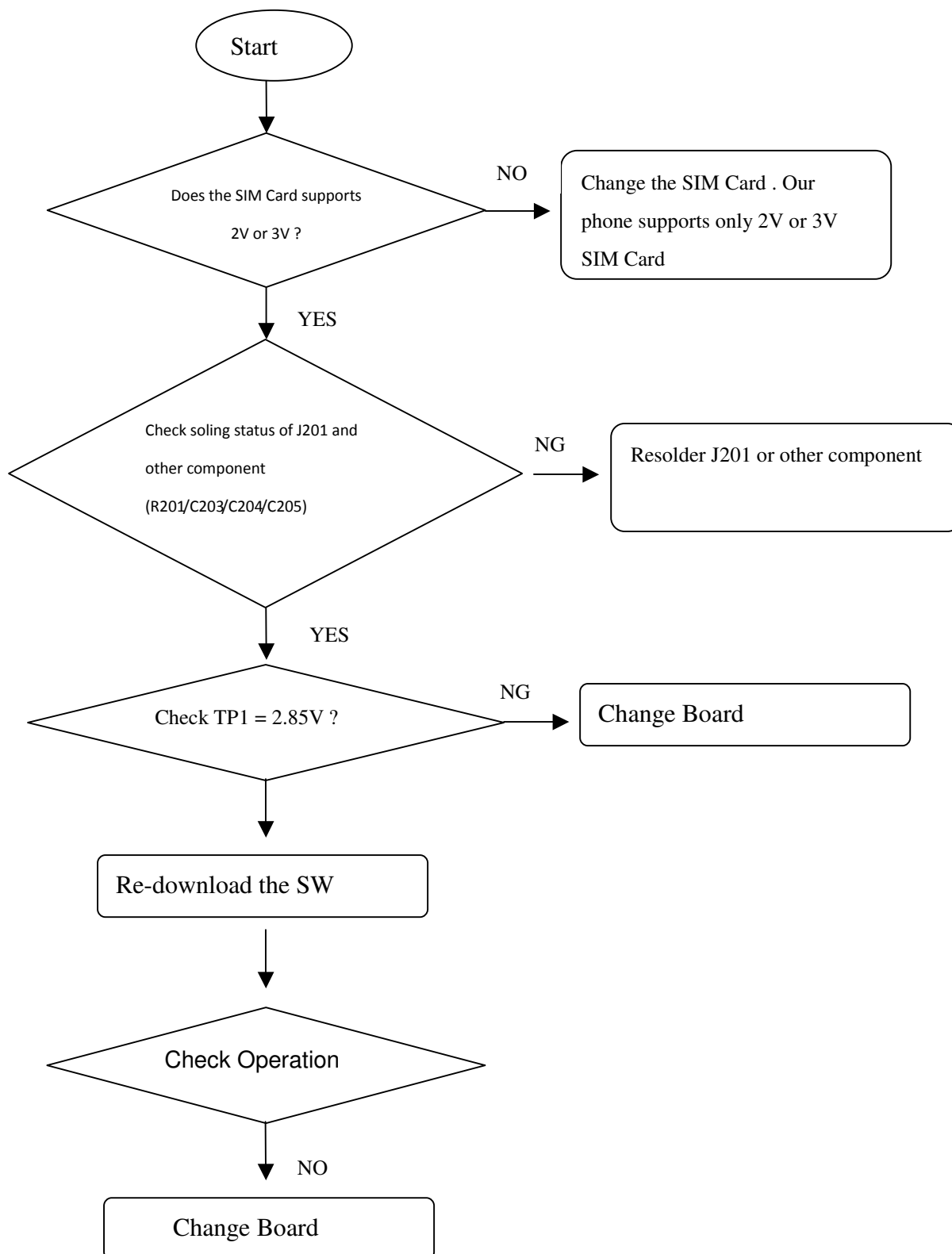


Circuit Diagram

SIM CONNECT

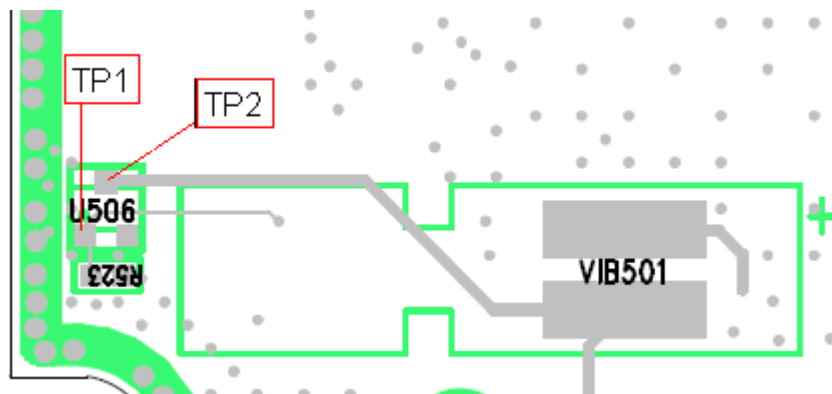


Checking Flow

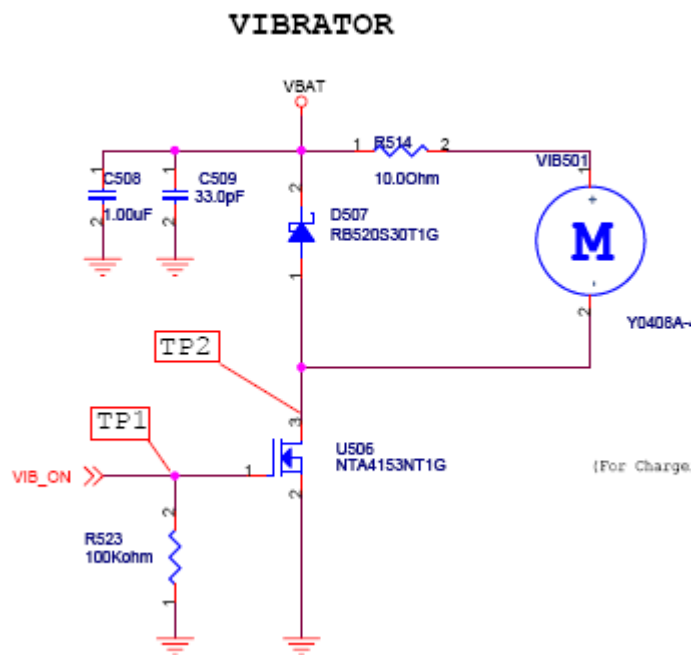


4.3 Vibrator Trouble

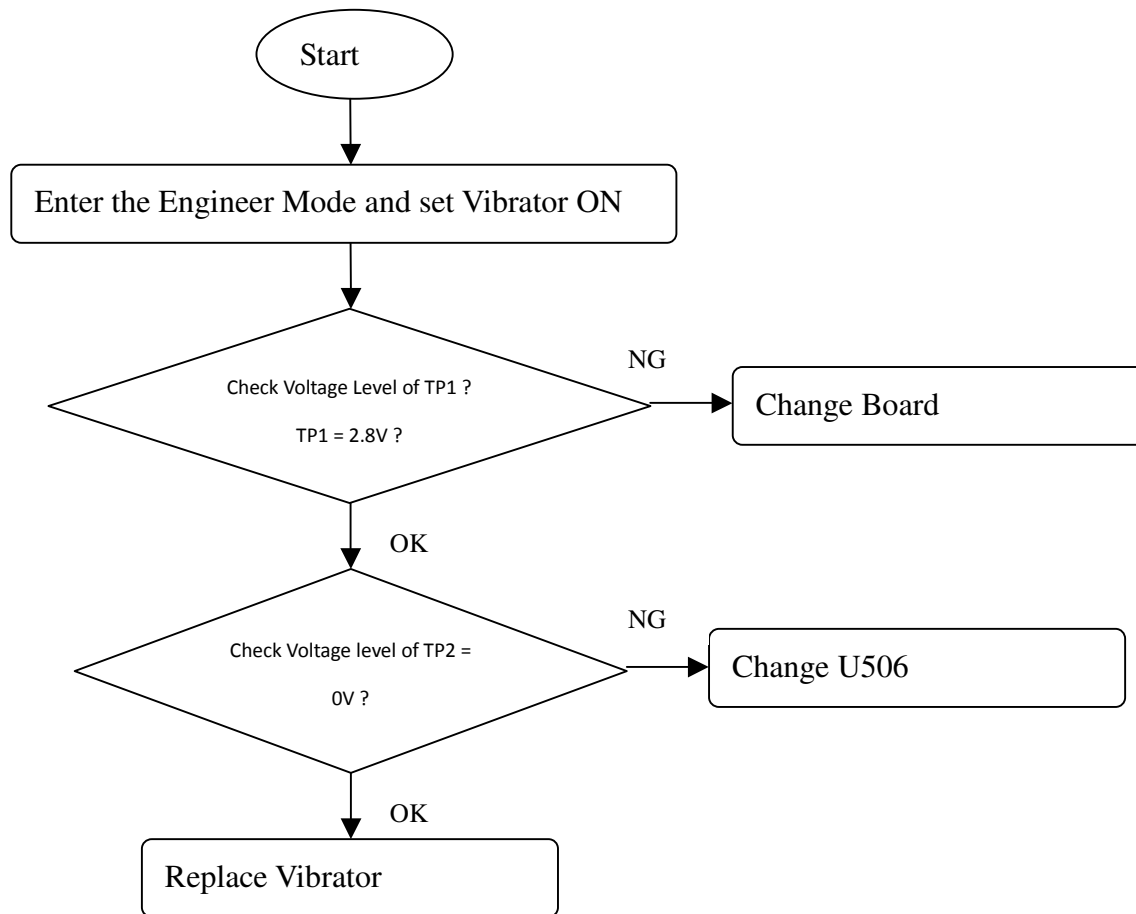
Test Point



Circuit Diagram

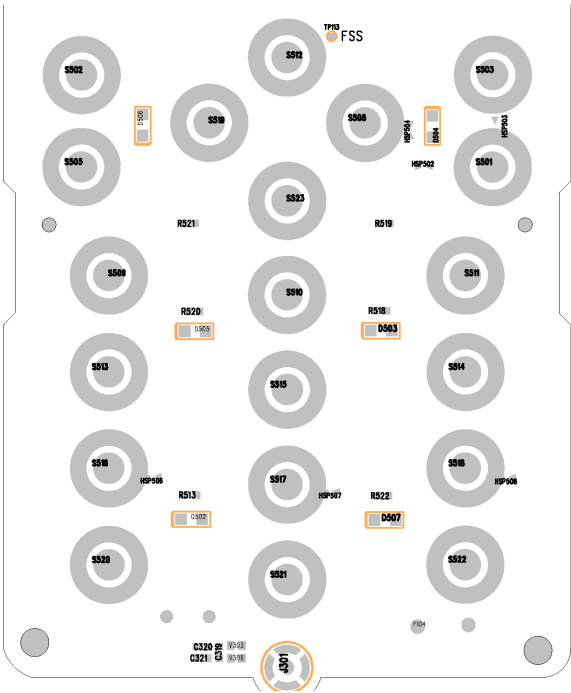


Checking Flow

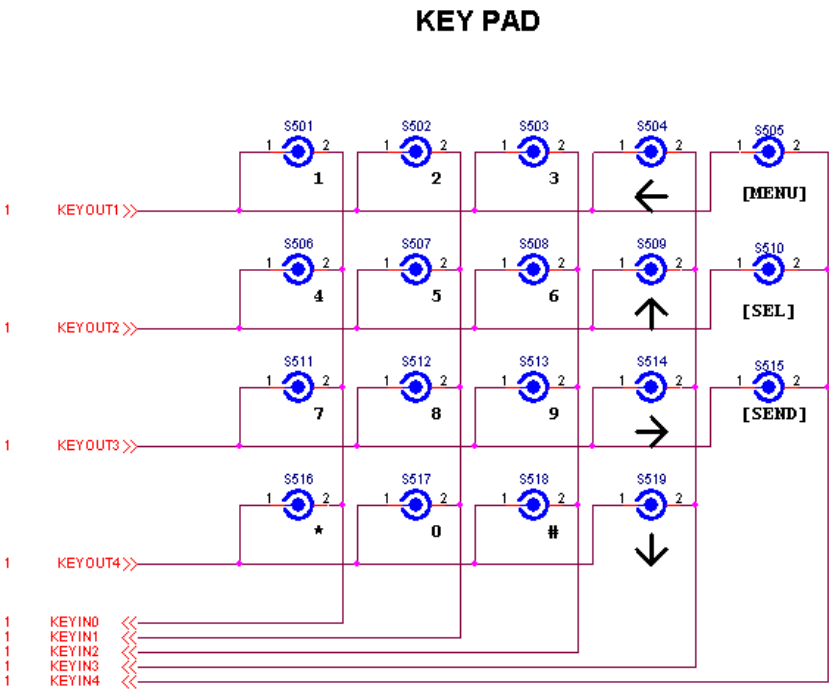


4.4 Keypad Trouble

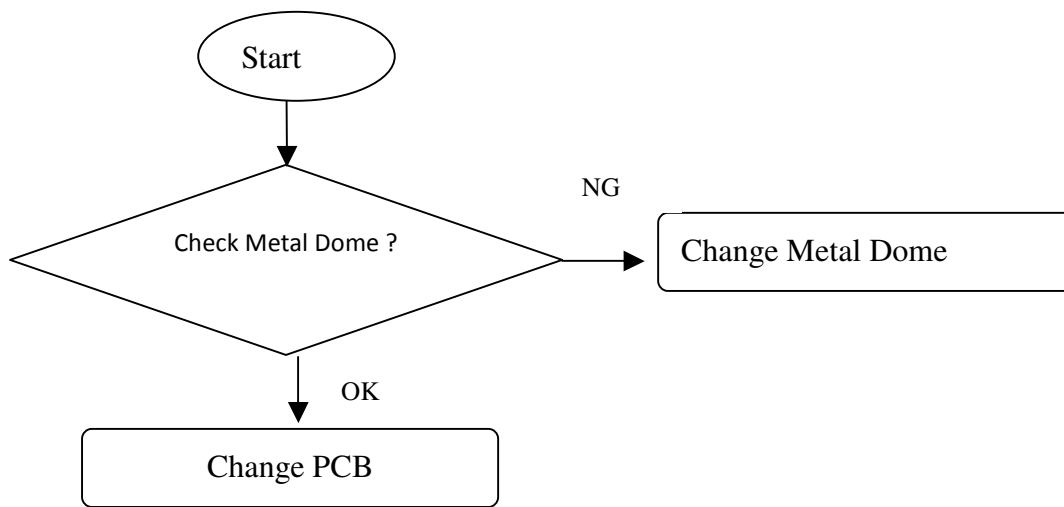
Test Point



Circuit Diagram

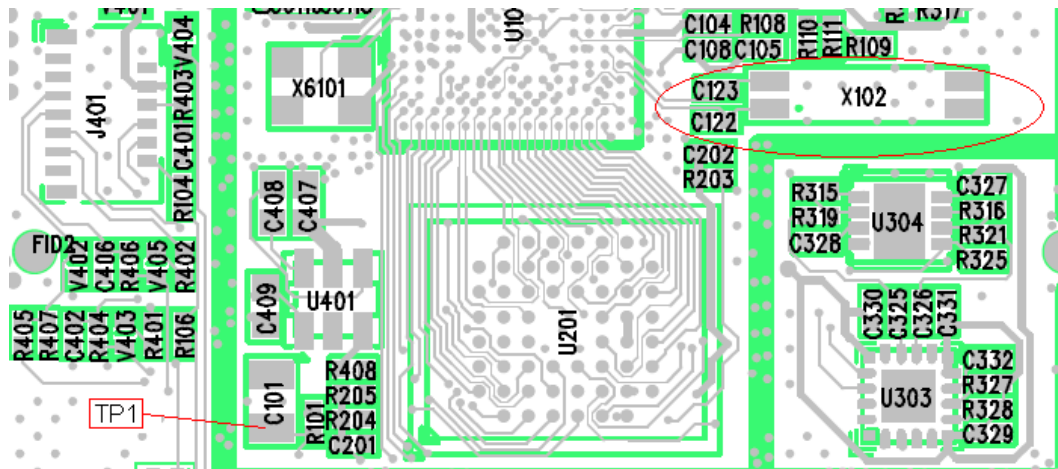


Checking Flow

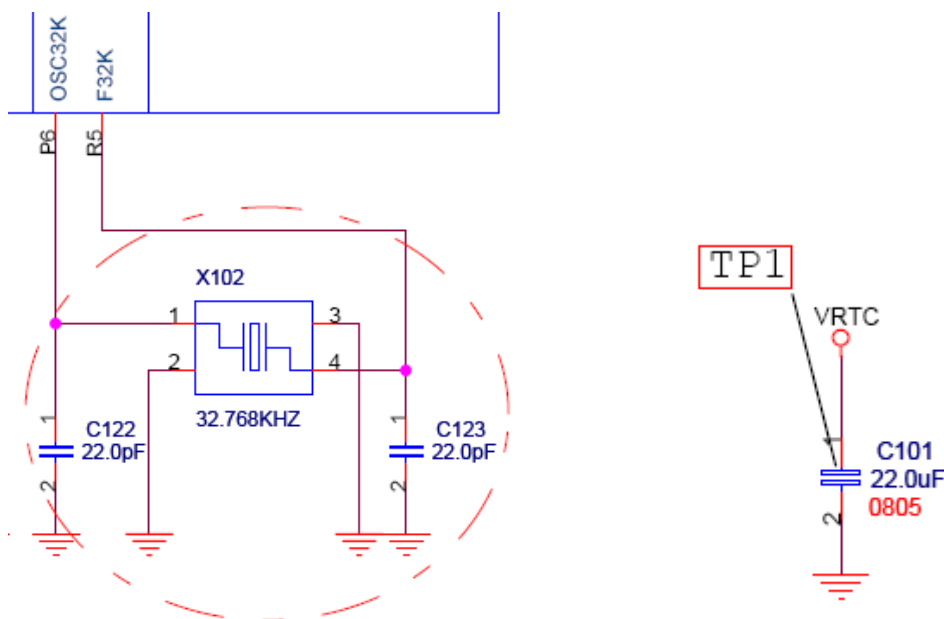


4.5 RTC Trouble

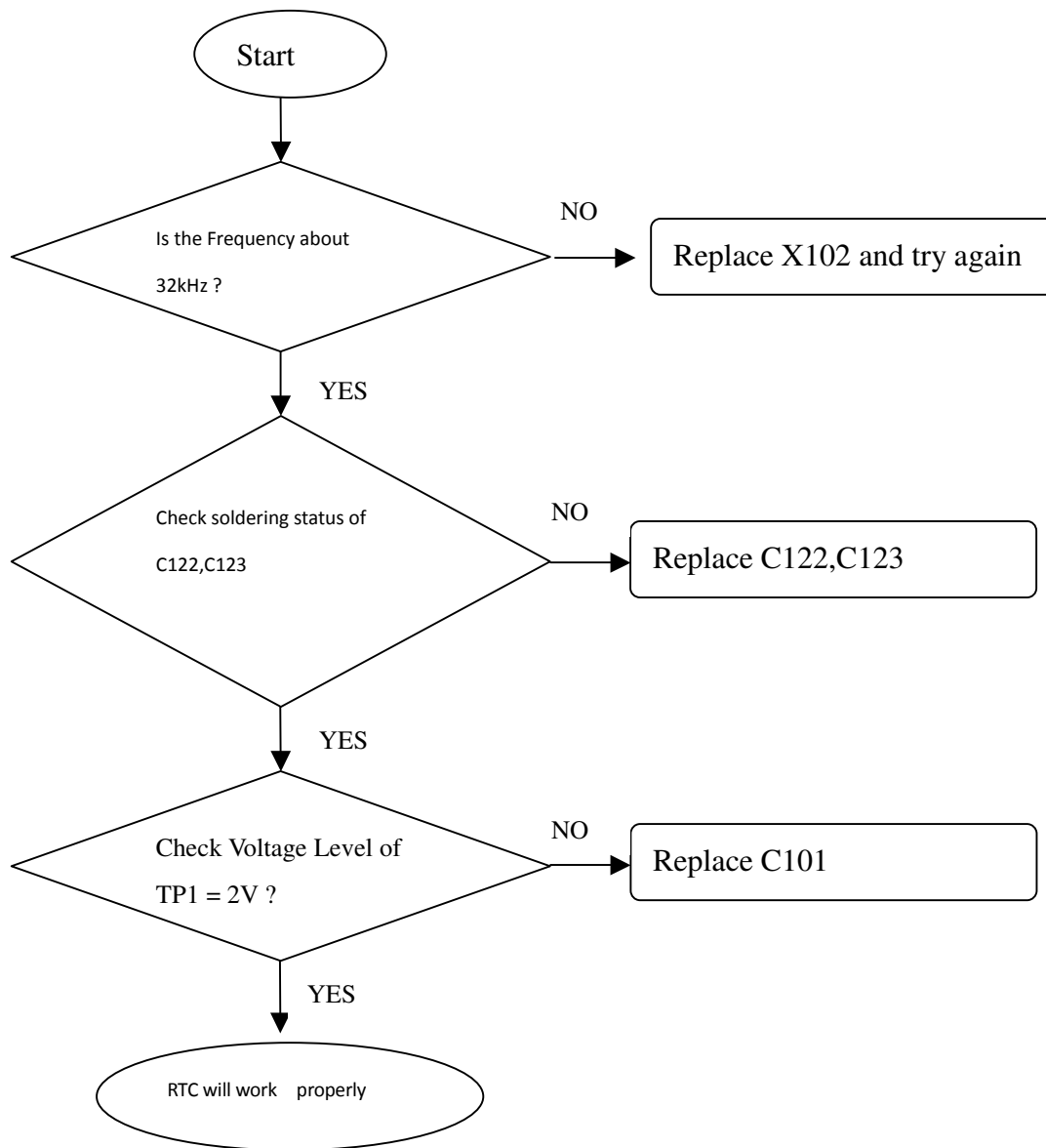
Test Point



Circuit Diagram

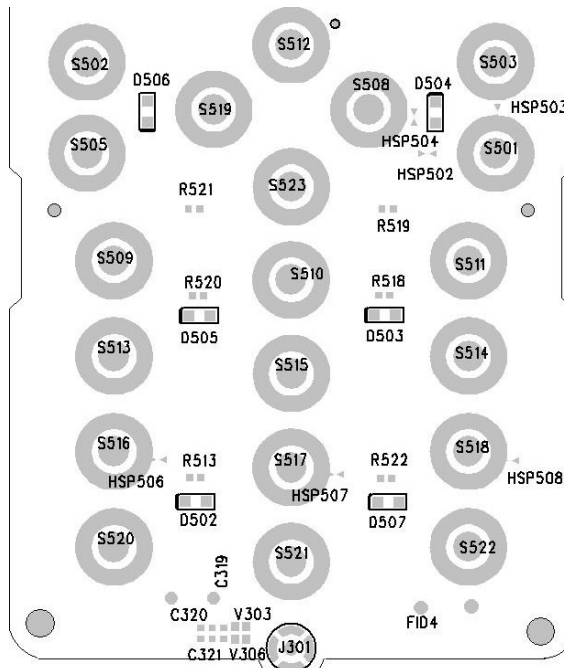
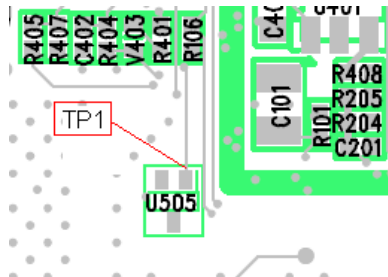


Checking Flow



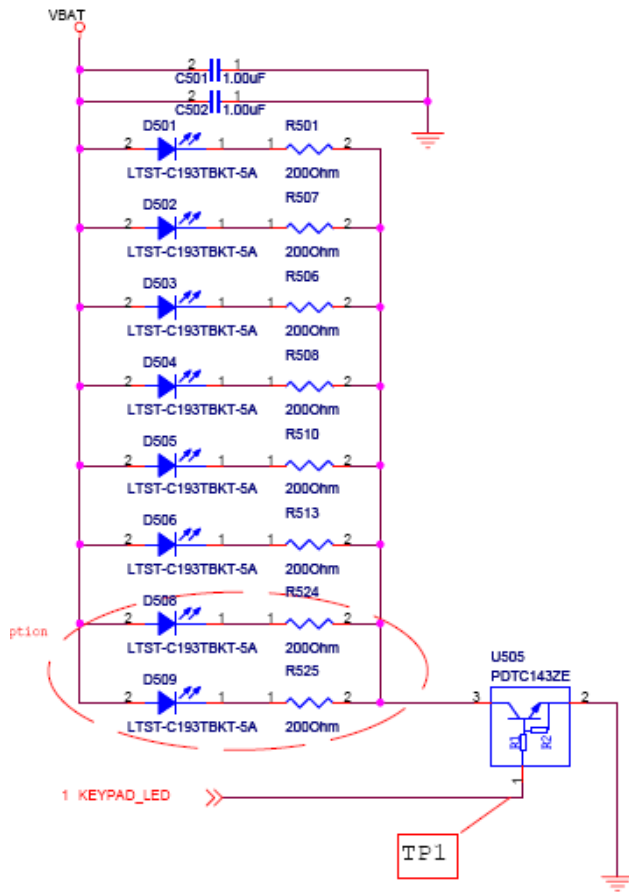
4.6 Key Backlight Trouble

1.1.1 Test Point

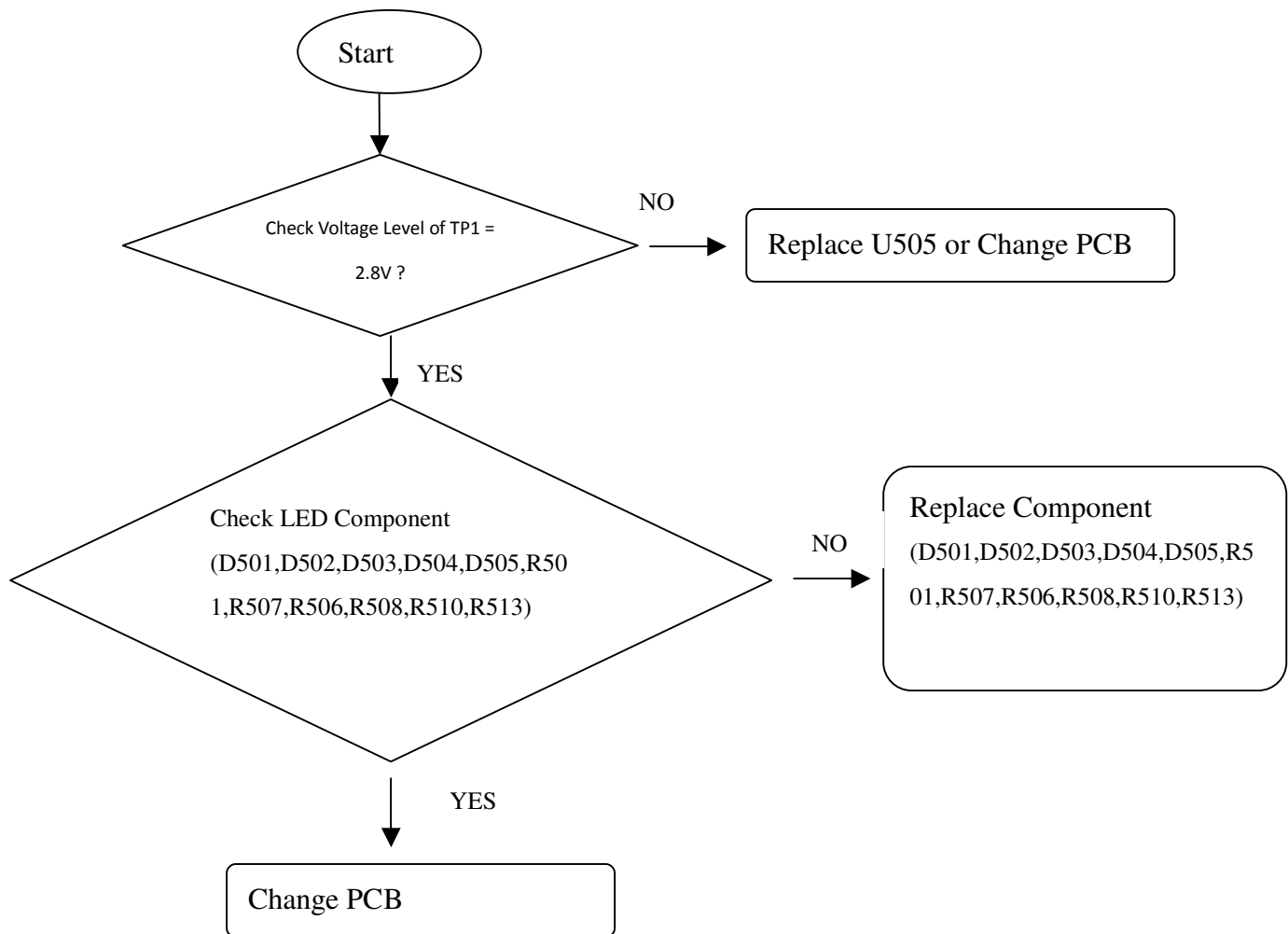


Circuit Diagram

KEY BACKLIGHT

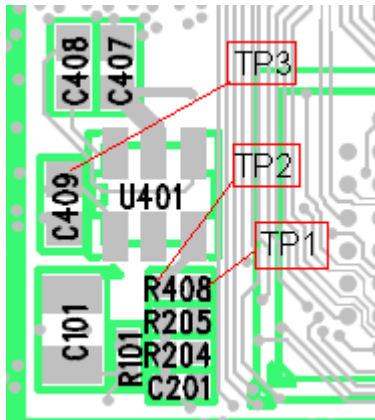


Checking Flow



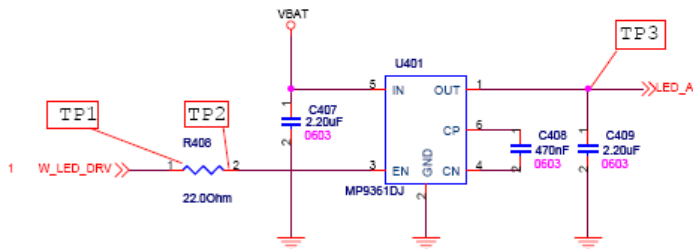
4.7 LCM Backlight Trouble

Test Point

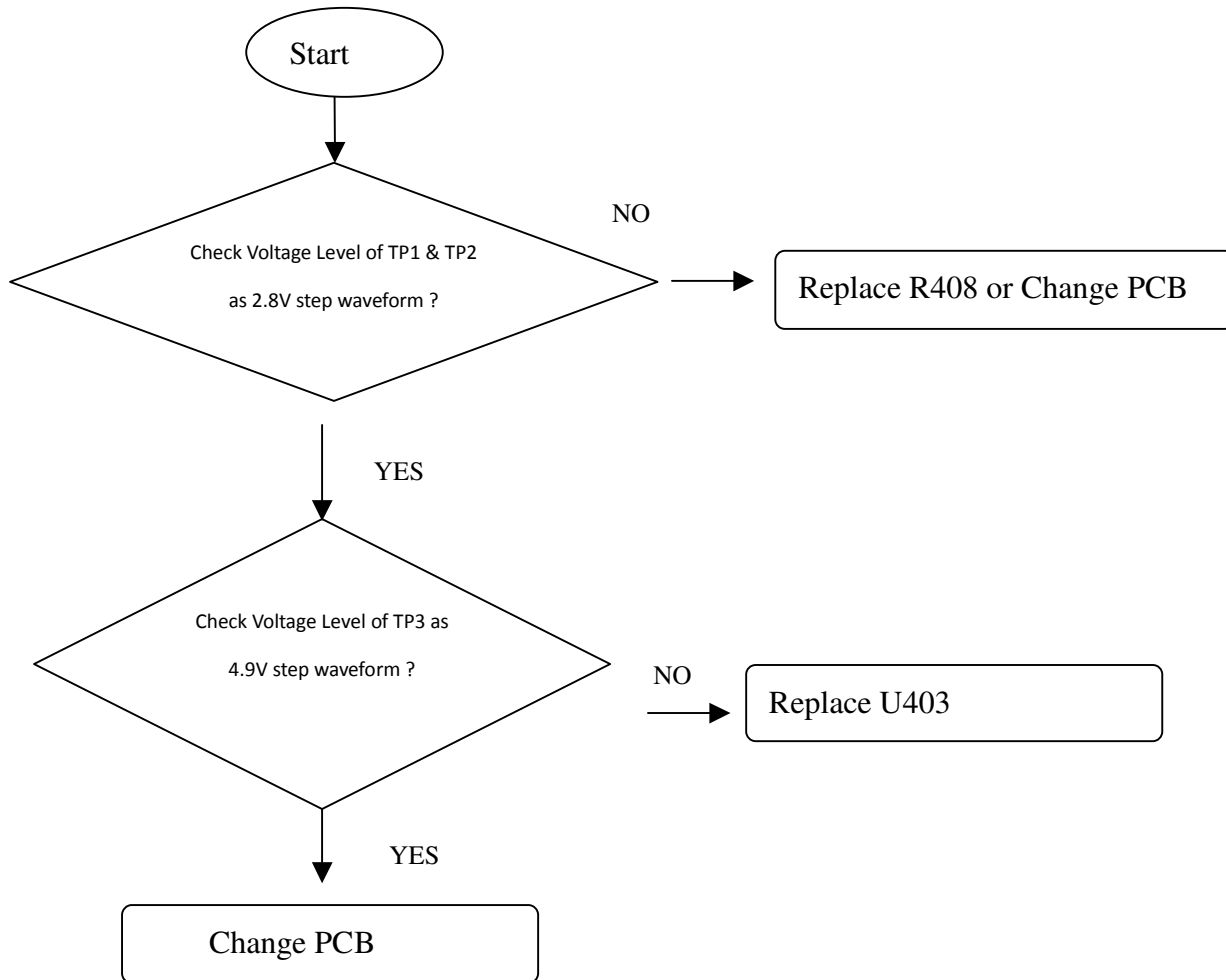


Circuit Diagram

CHARGING PUMP

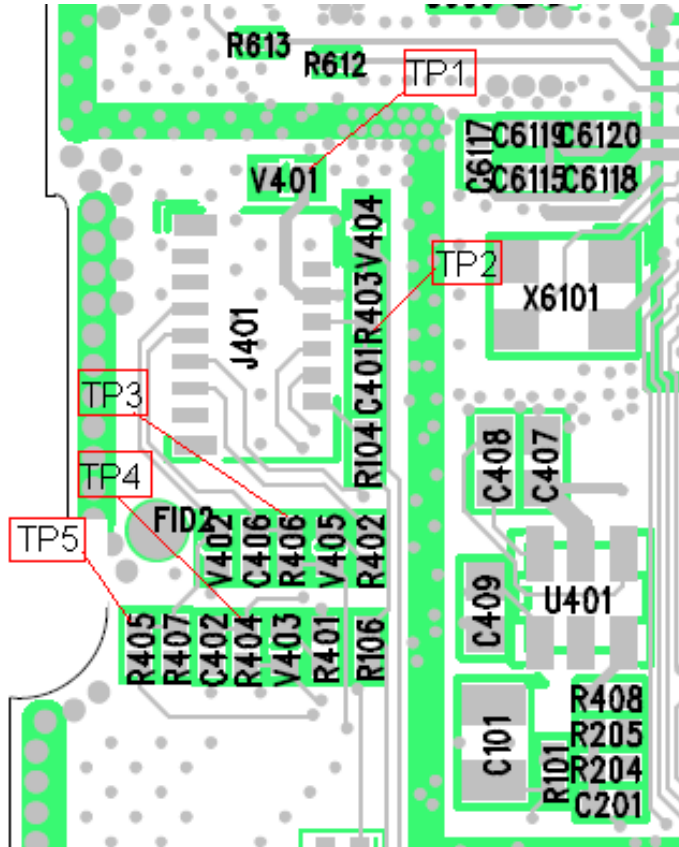


Checking Flow

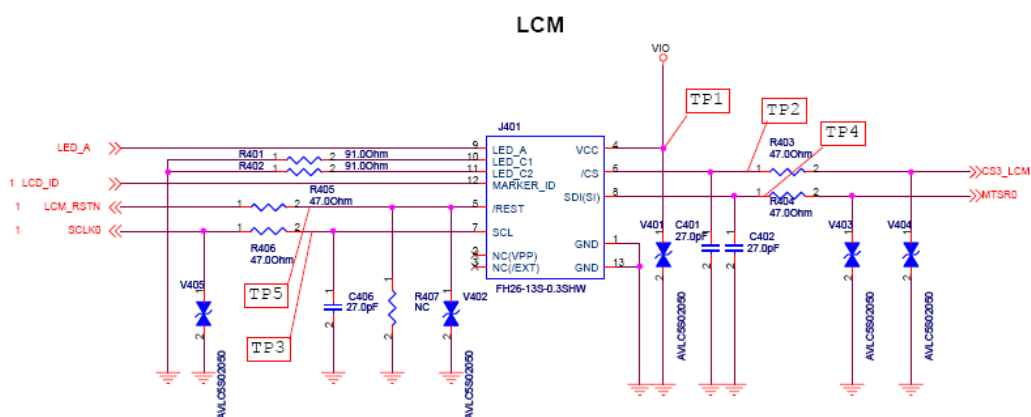


4.8 LCM Trouble

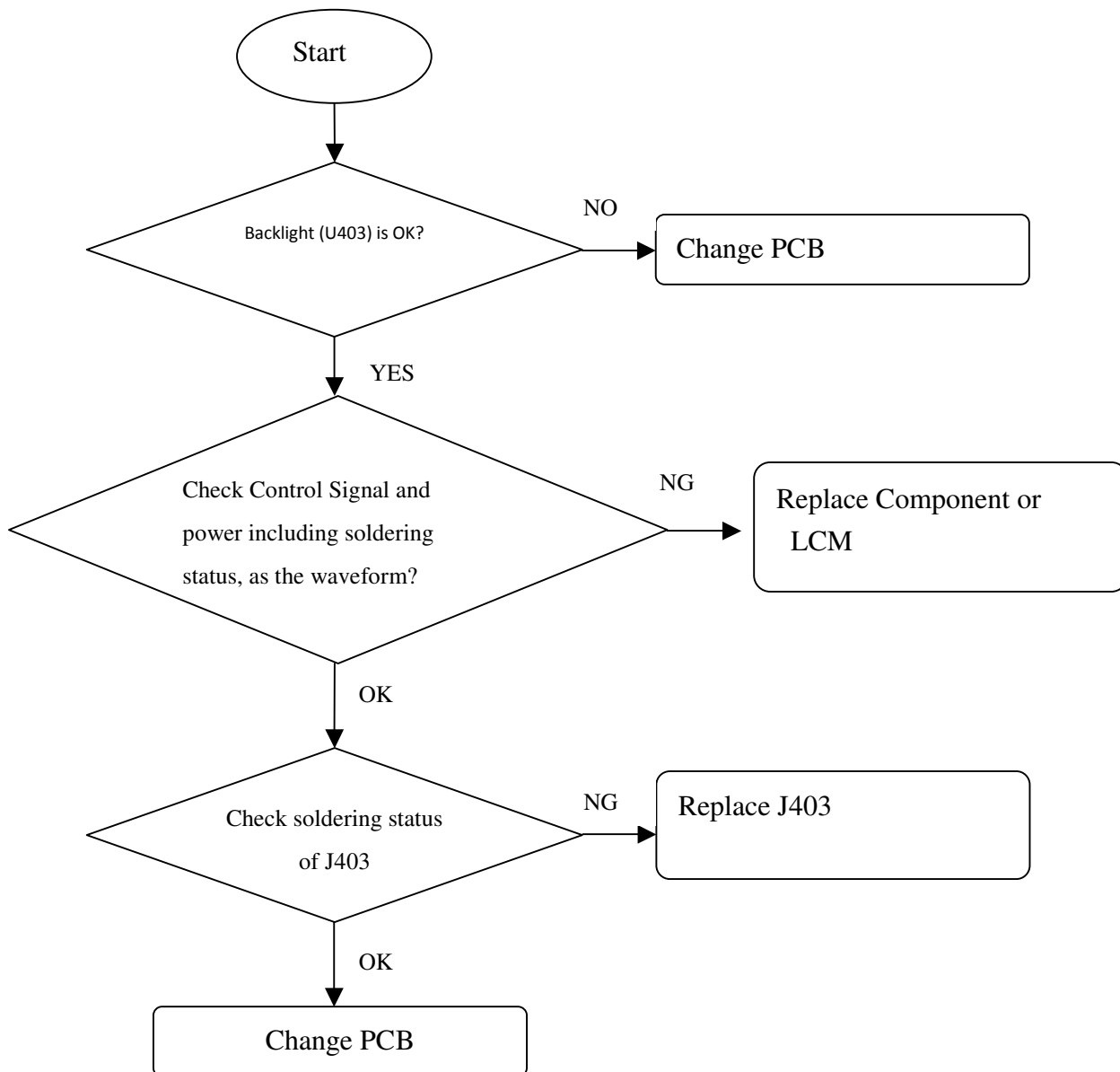
Test Point



Circuit Diagram

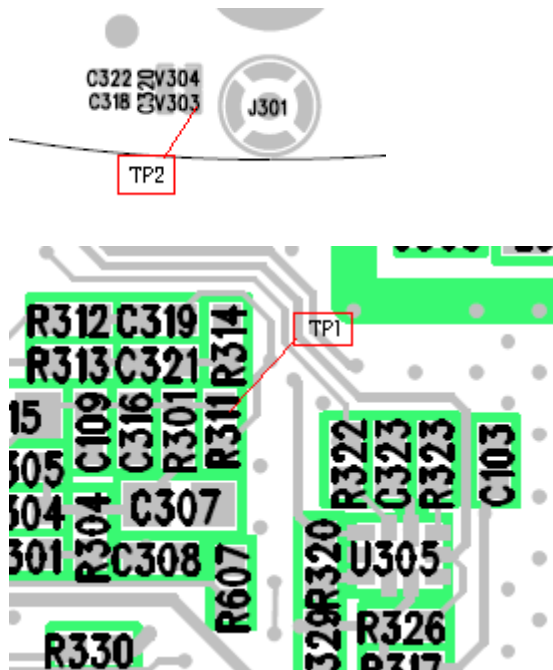


Checking Flow

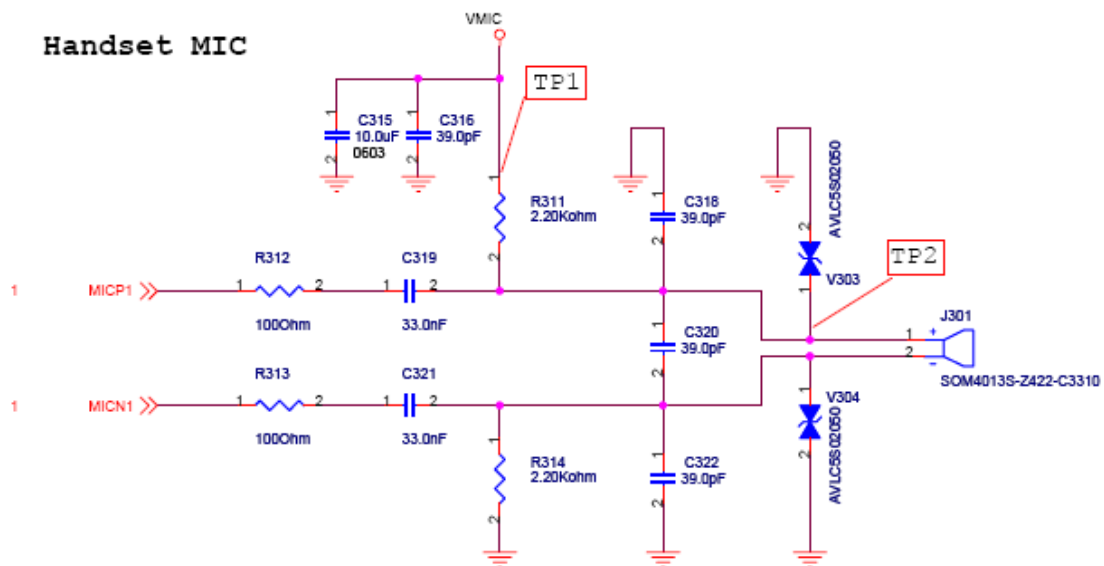


4.9 Microphone Trouble

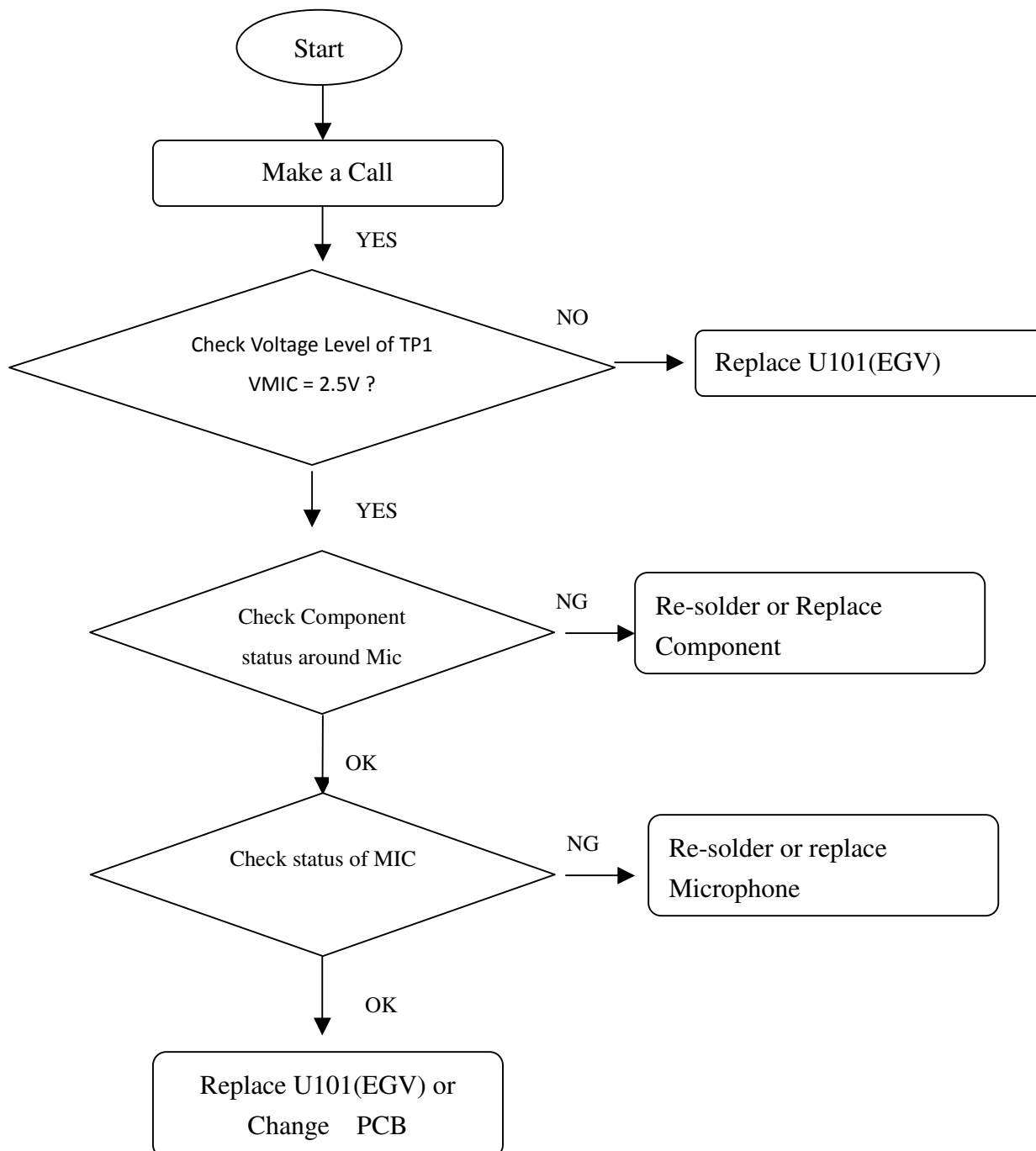
Test Point



Circuit Diagram

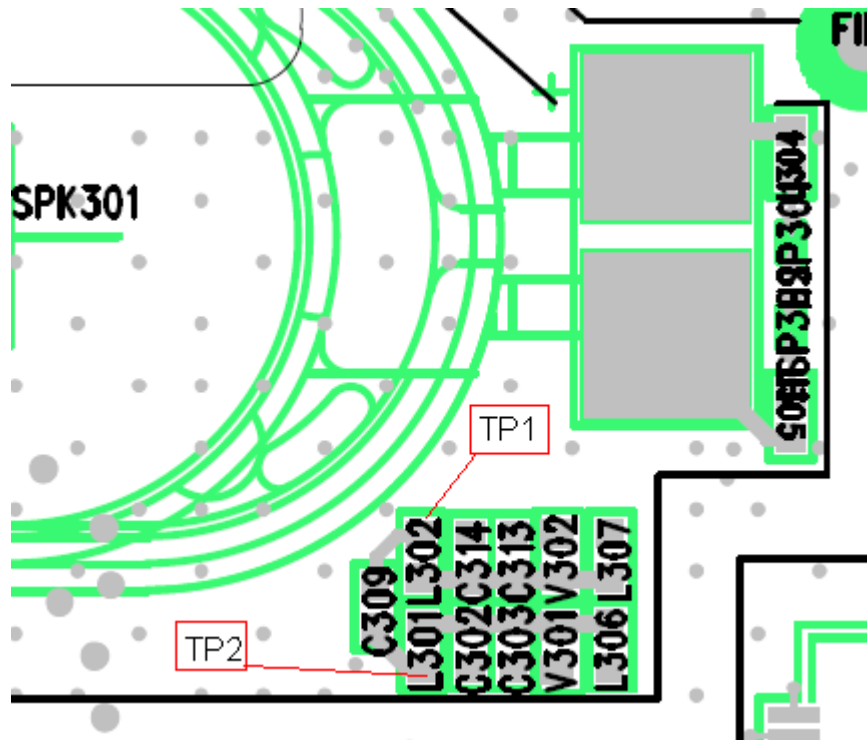


Checking Flow

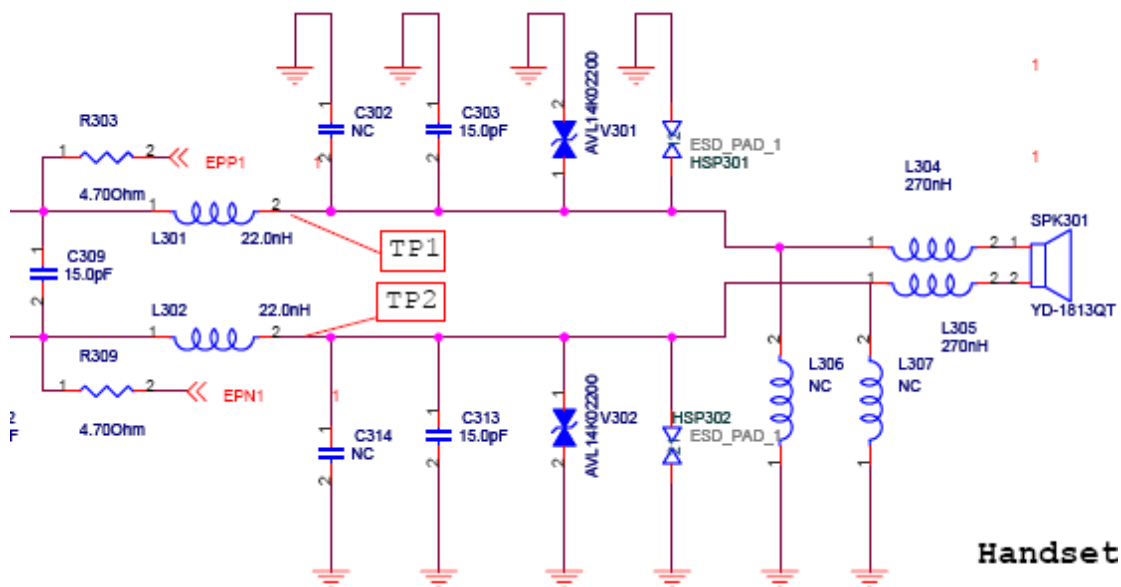


4.10 Receiver Trouble

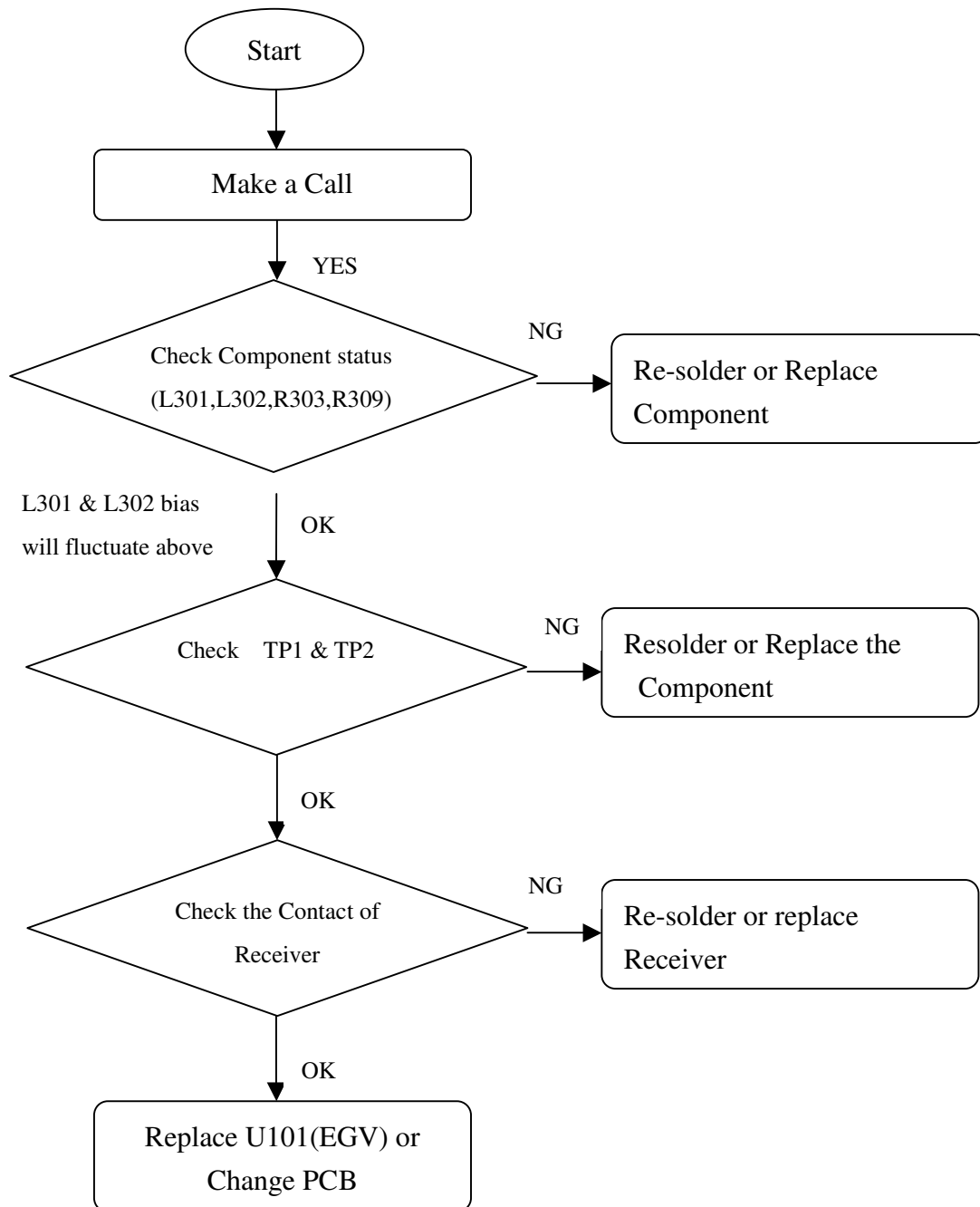
Test Point



Circuit Diagram



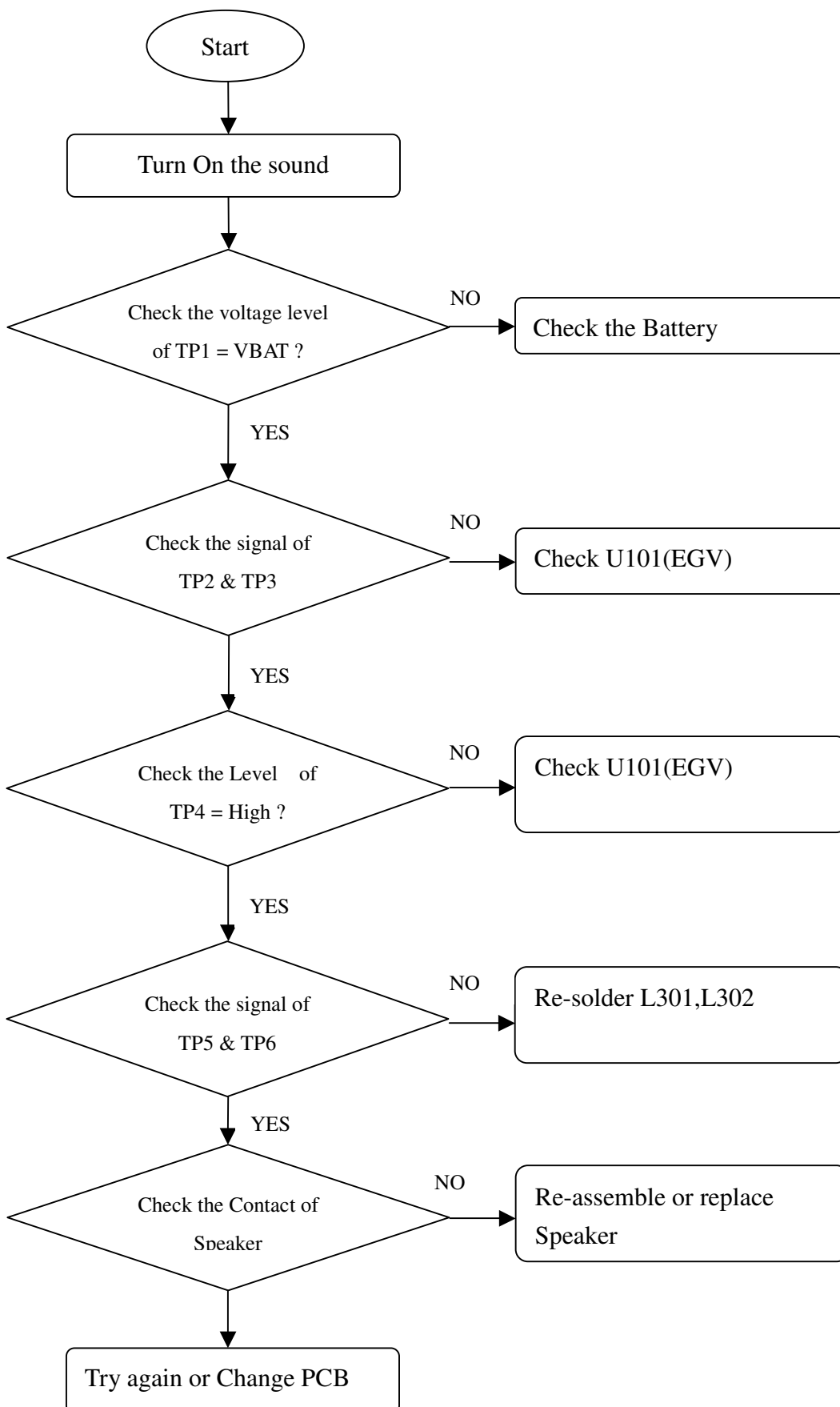
Checking Flow



Test Point

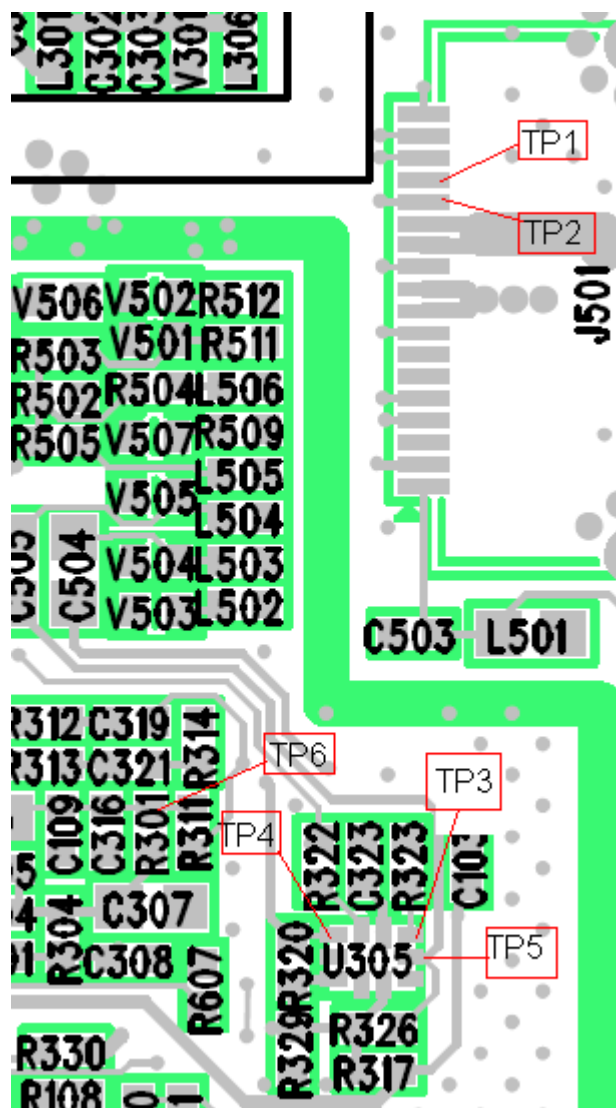


Checking Flow

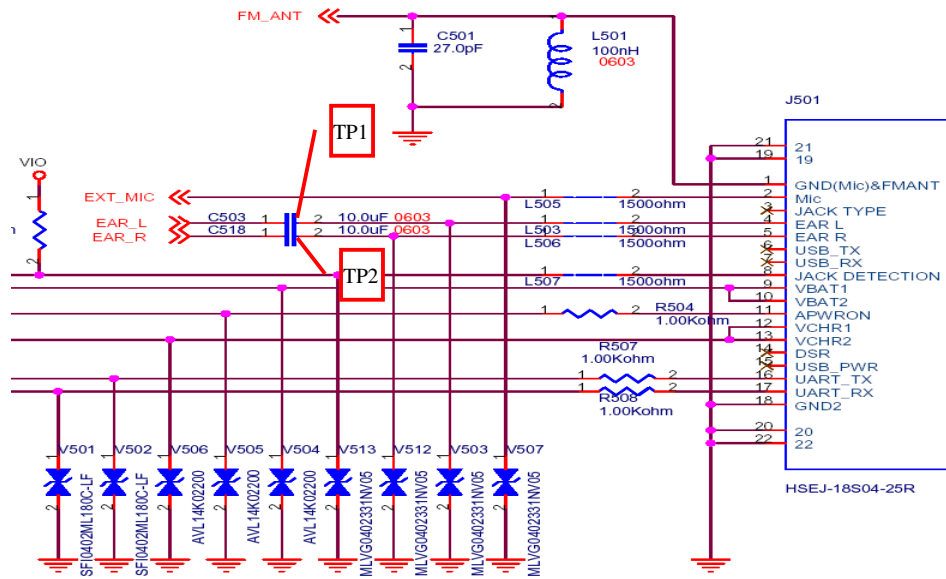


4.12 Headphone Trouble

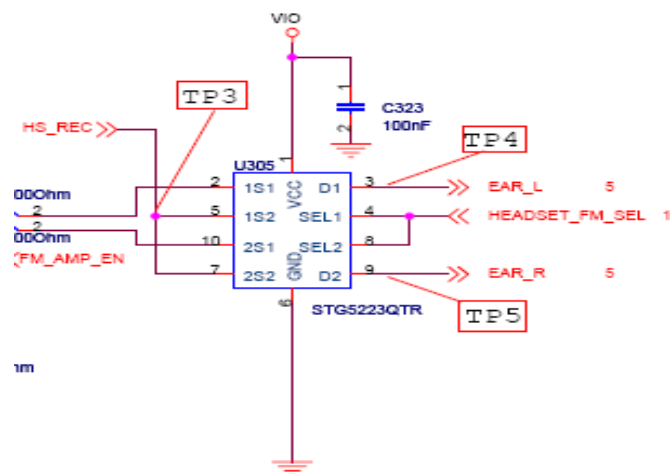
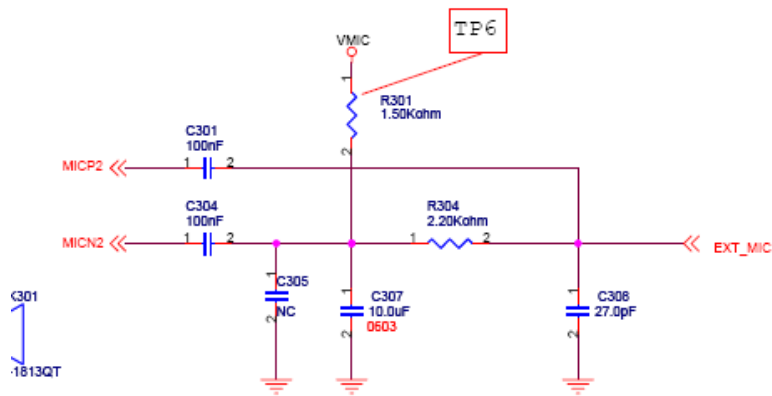
Test Point



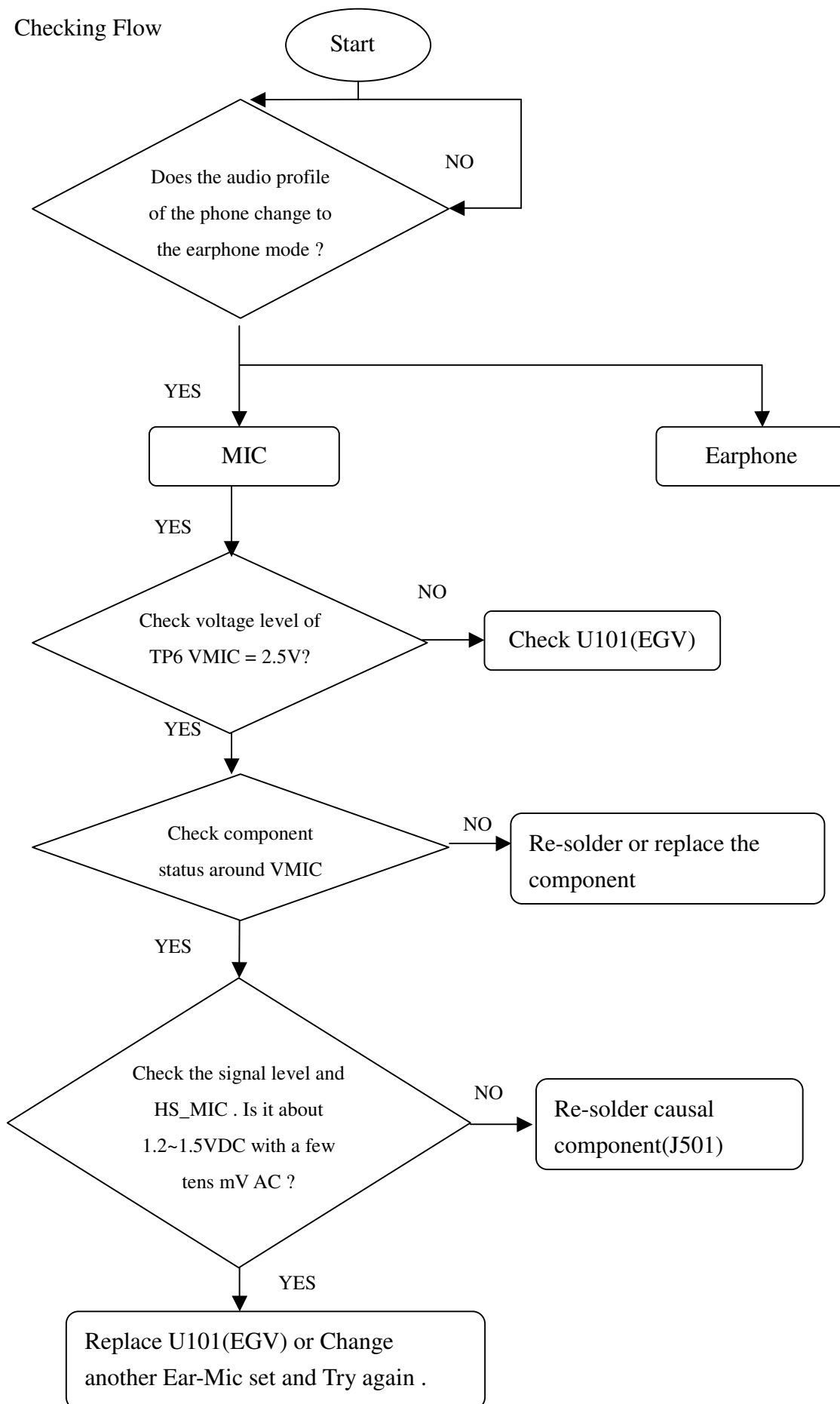
Circuit Diagram

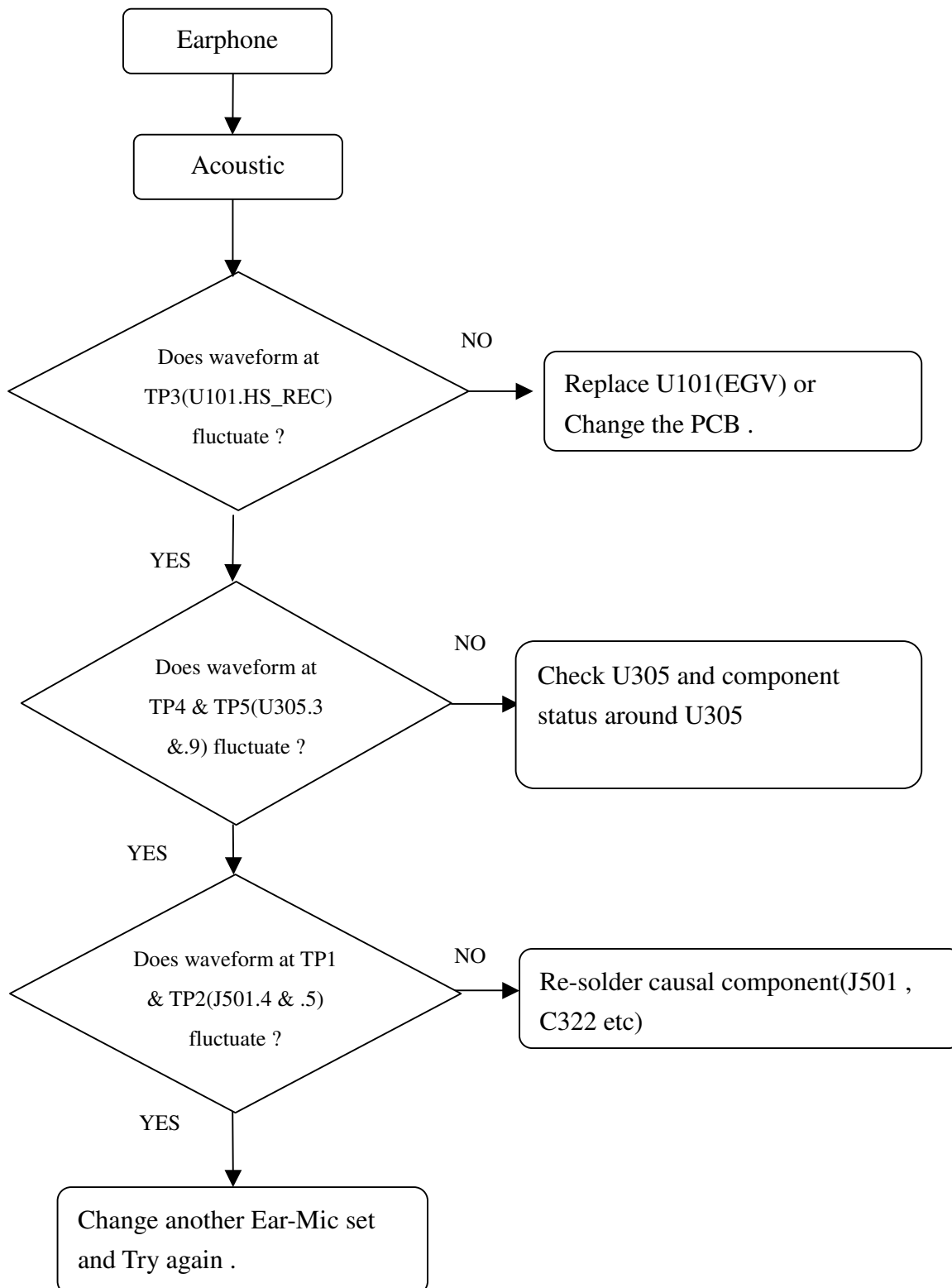


Headset MIC



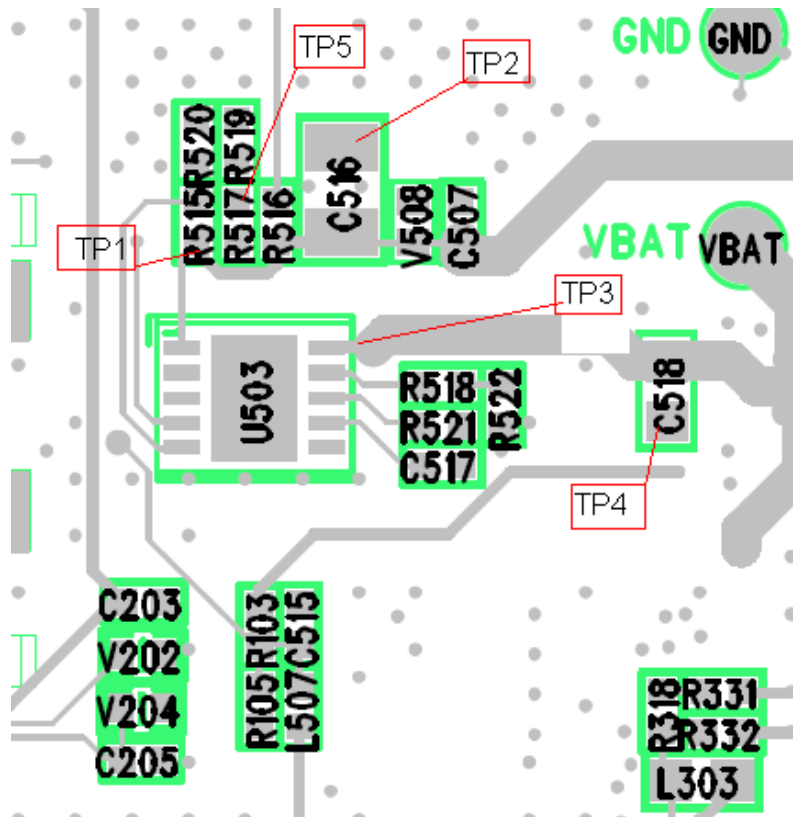
Checking Flow





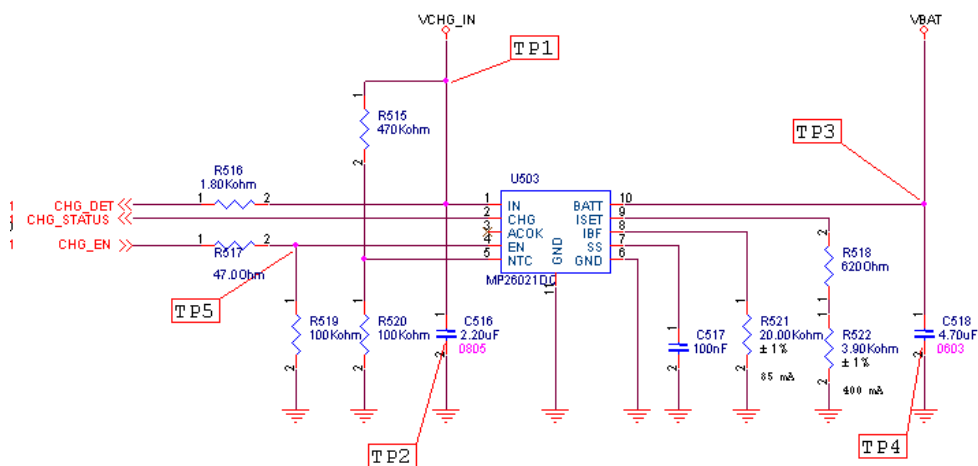
4.13 Charging Trouble

Test Point

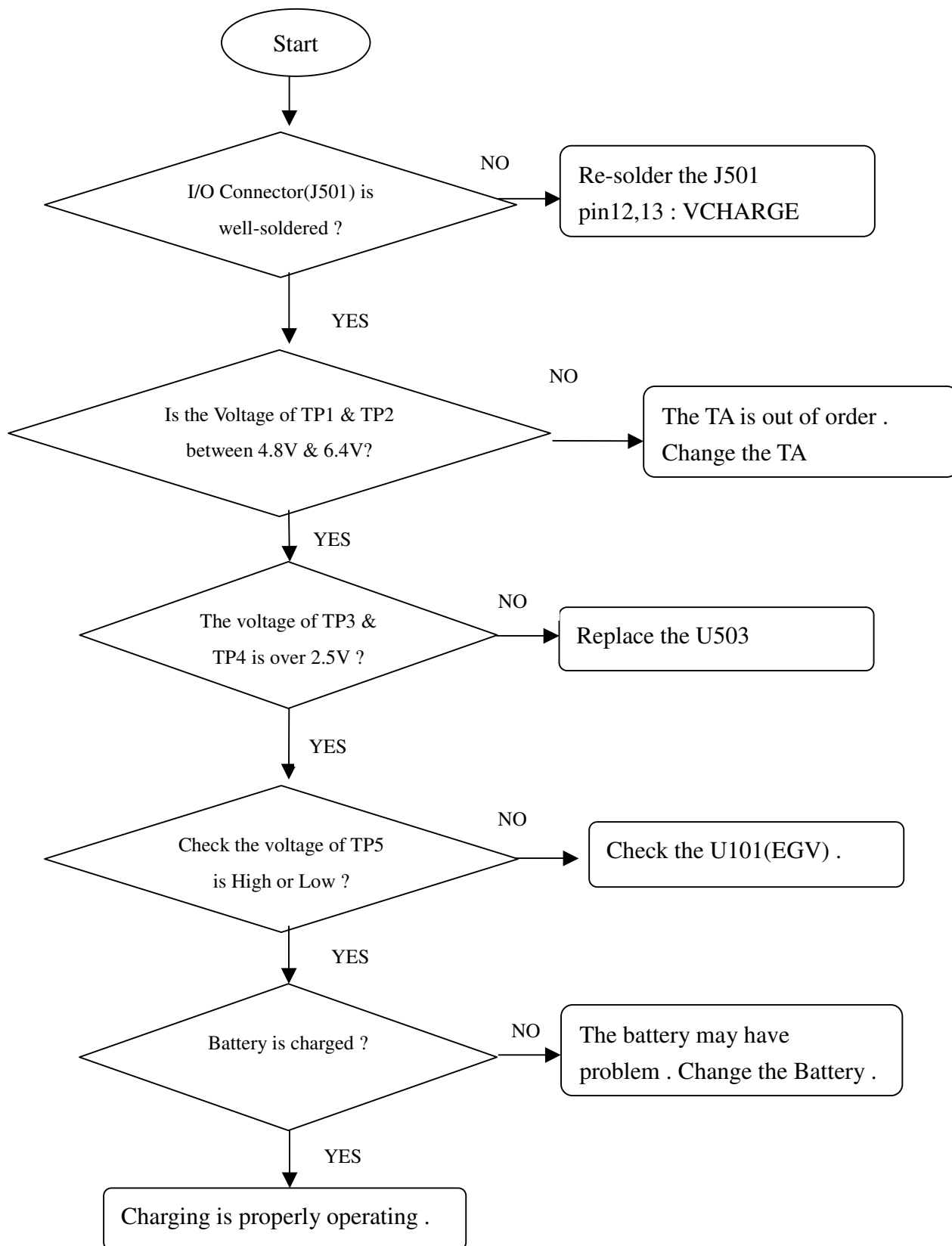


Circuit Diagram

CHARGING IC

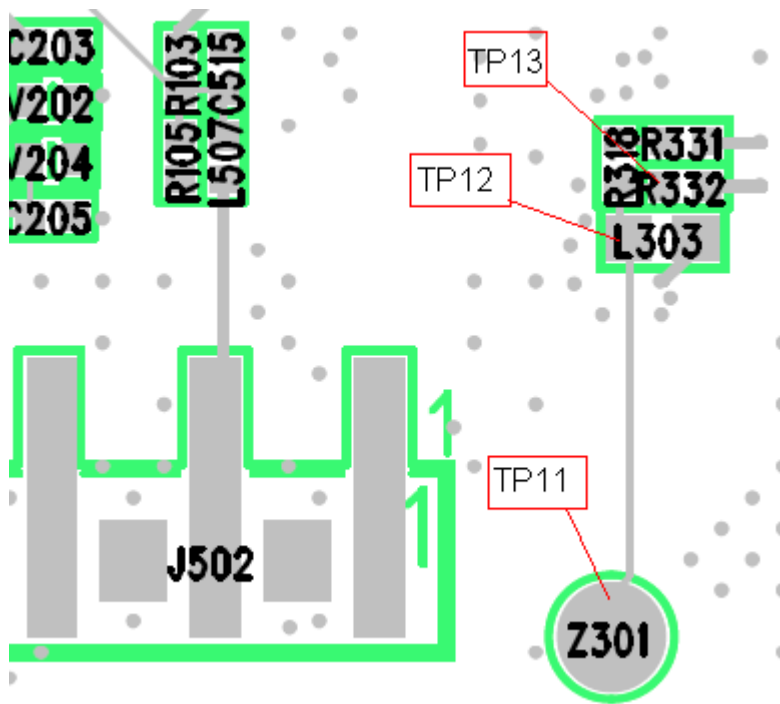
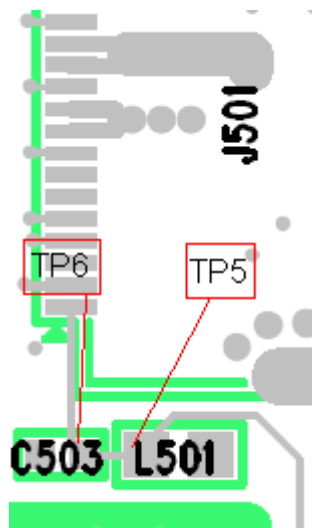


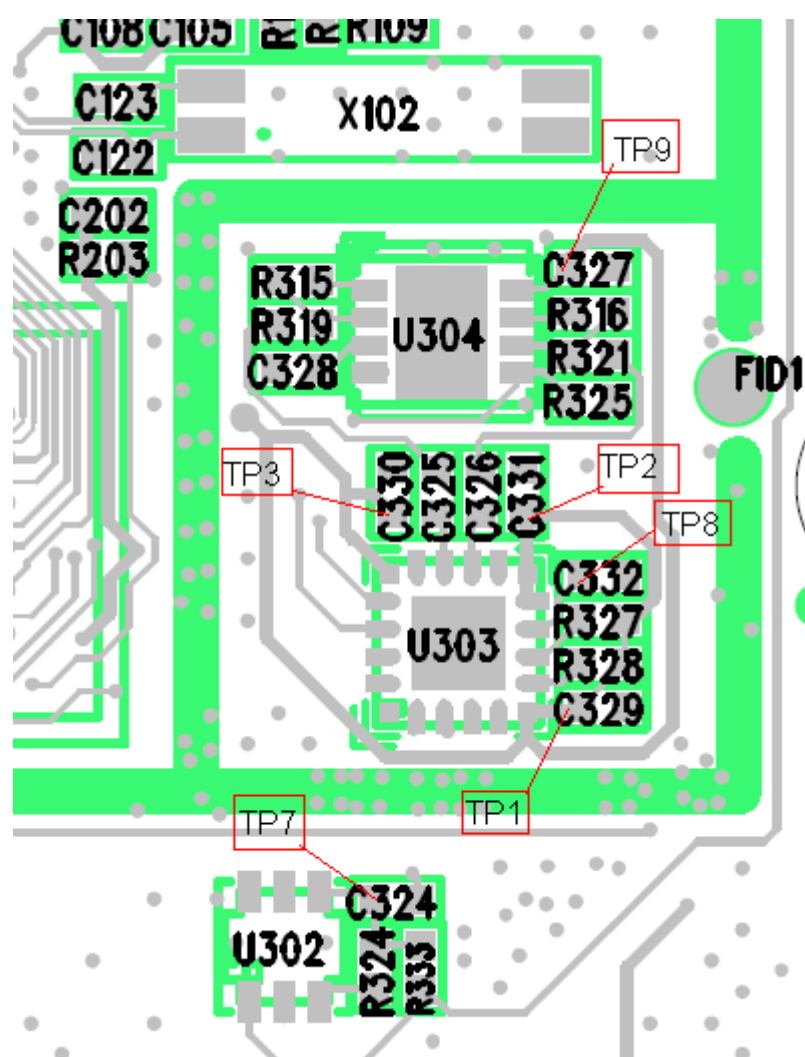
Checking Flow



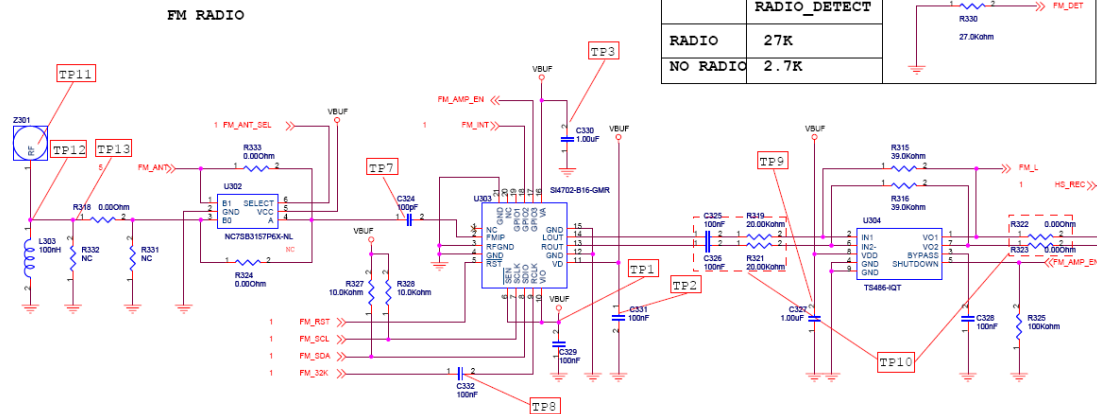
4.14 FM Radio Trouble

Test Point

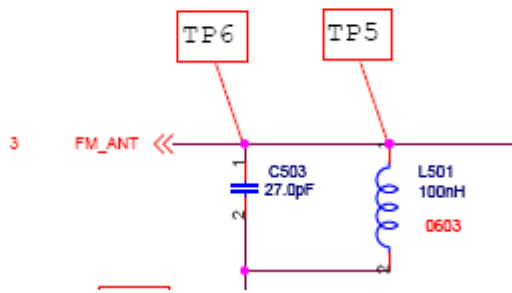




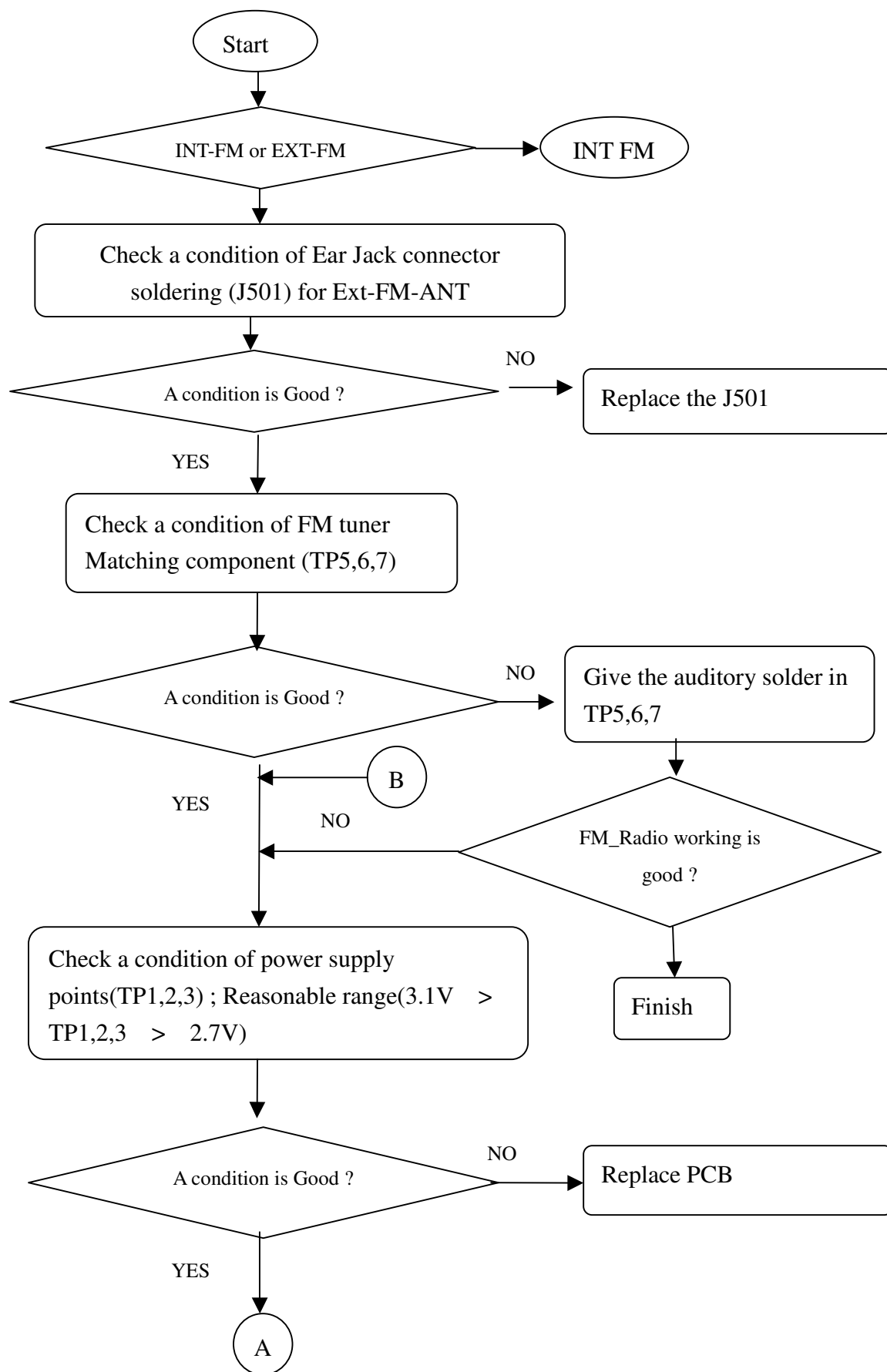
Circuit Diagram

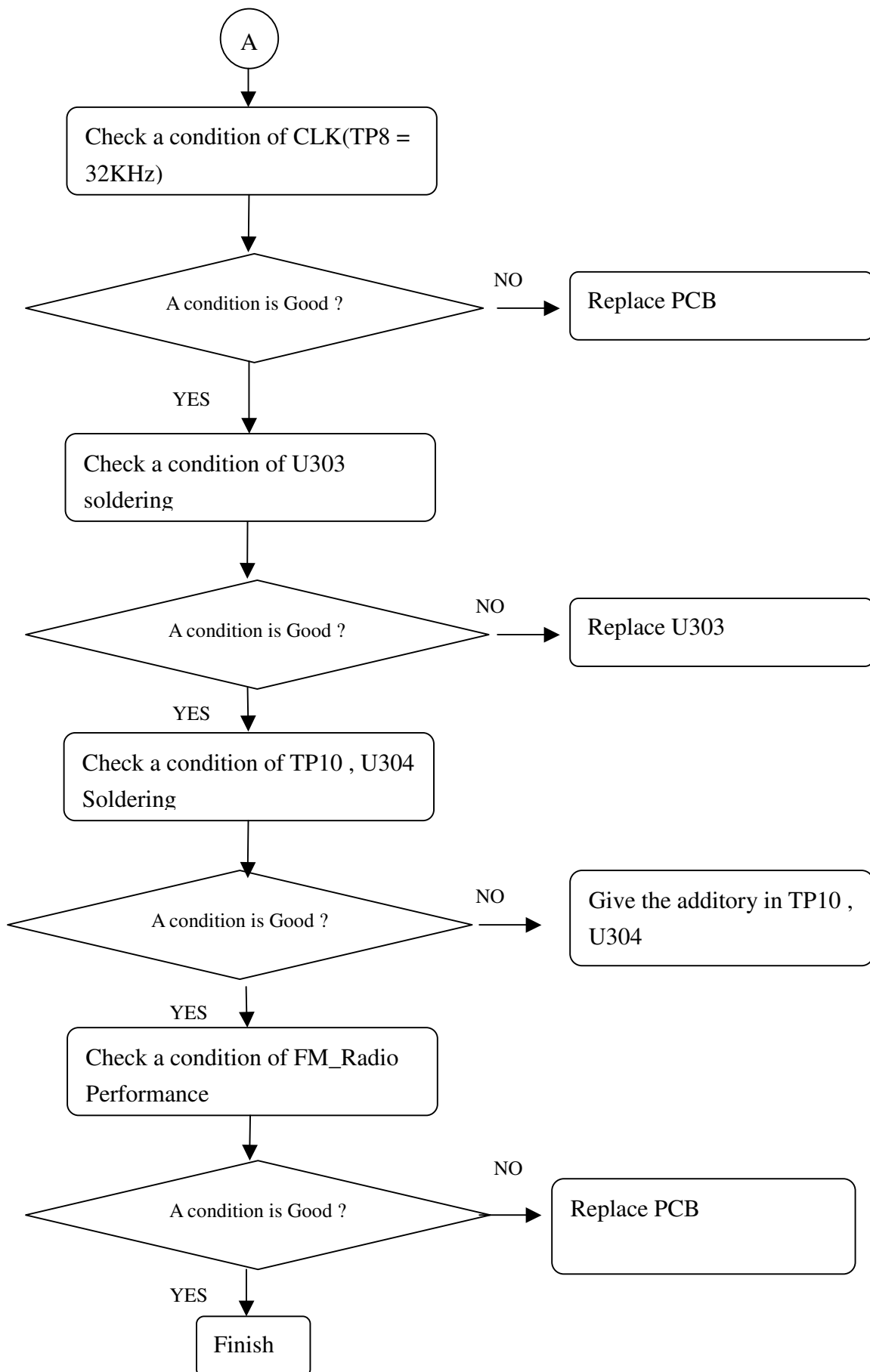


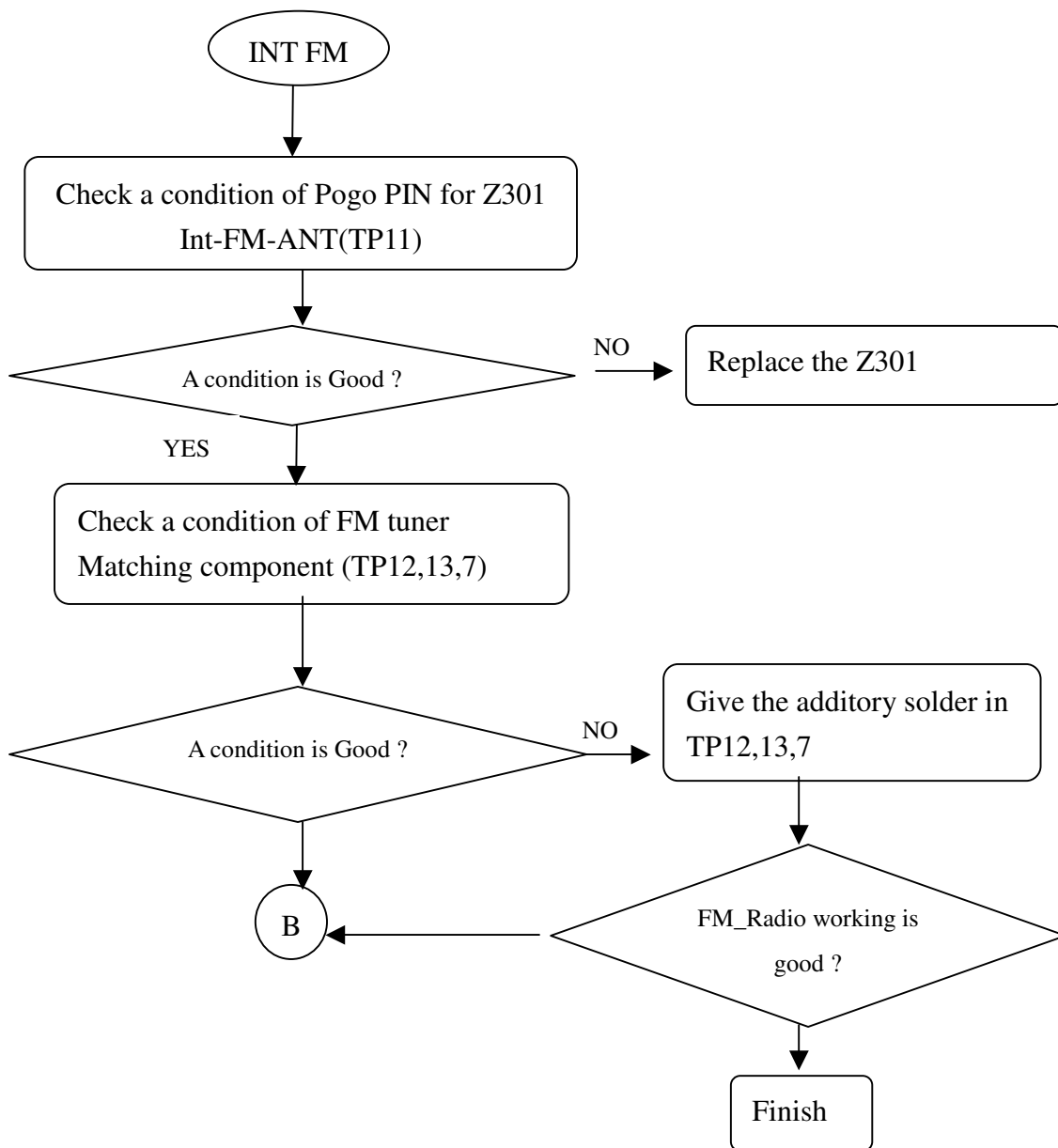
I/O CONNECTOR



Checking Flow

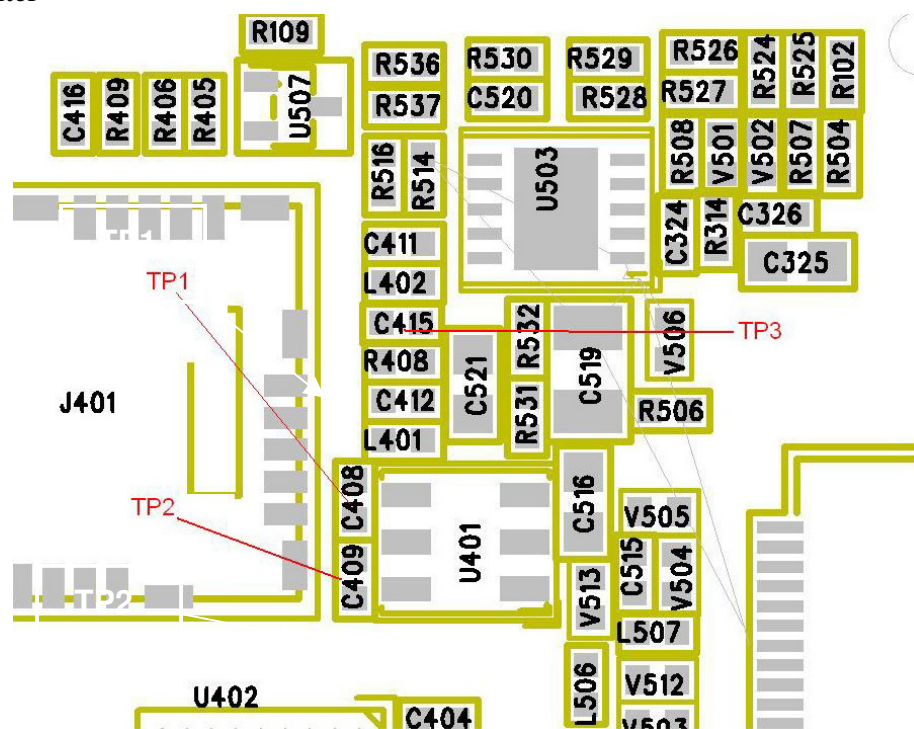




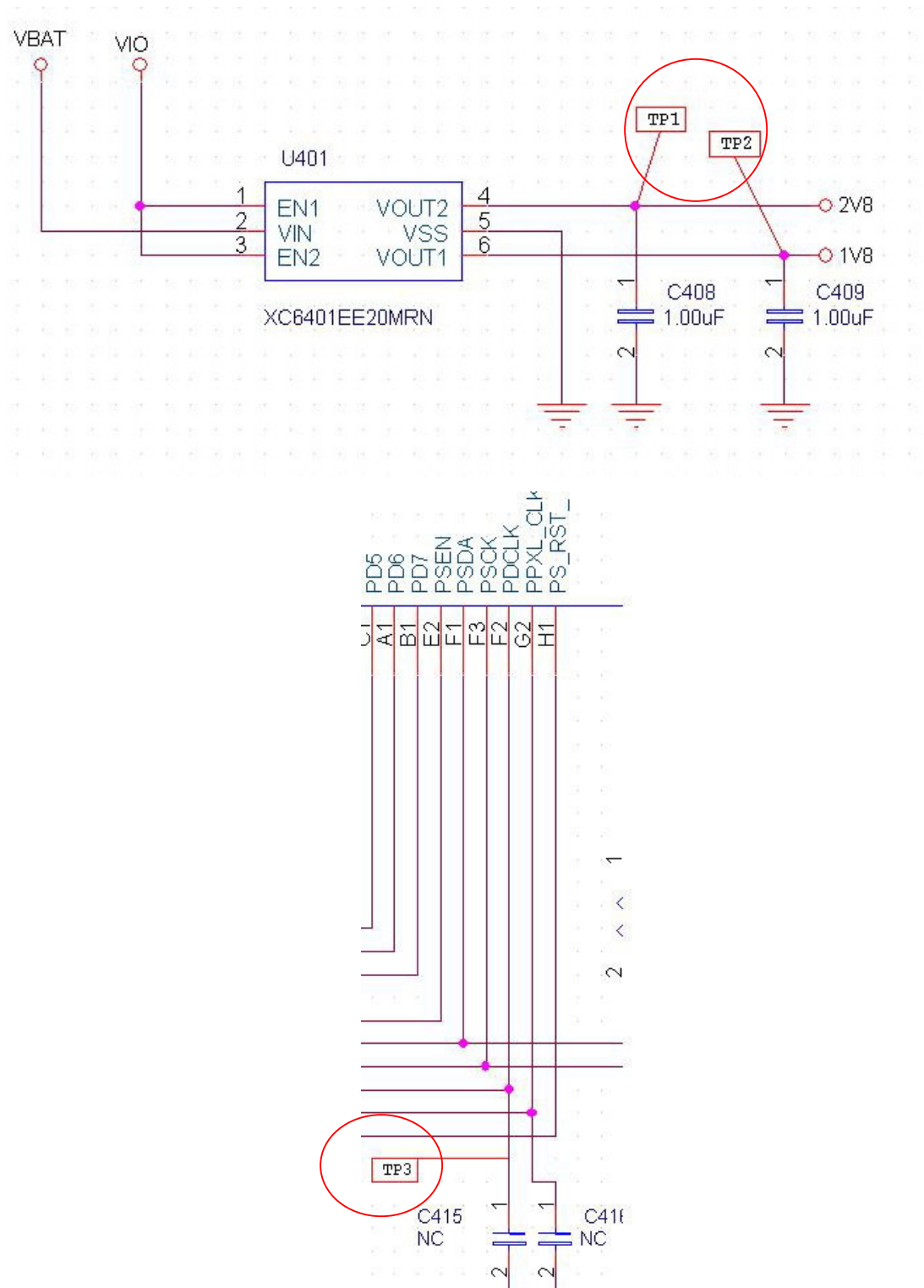


4.15 Camera Trouble

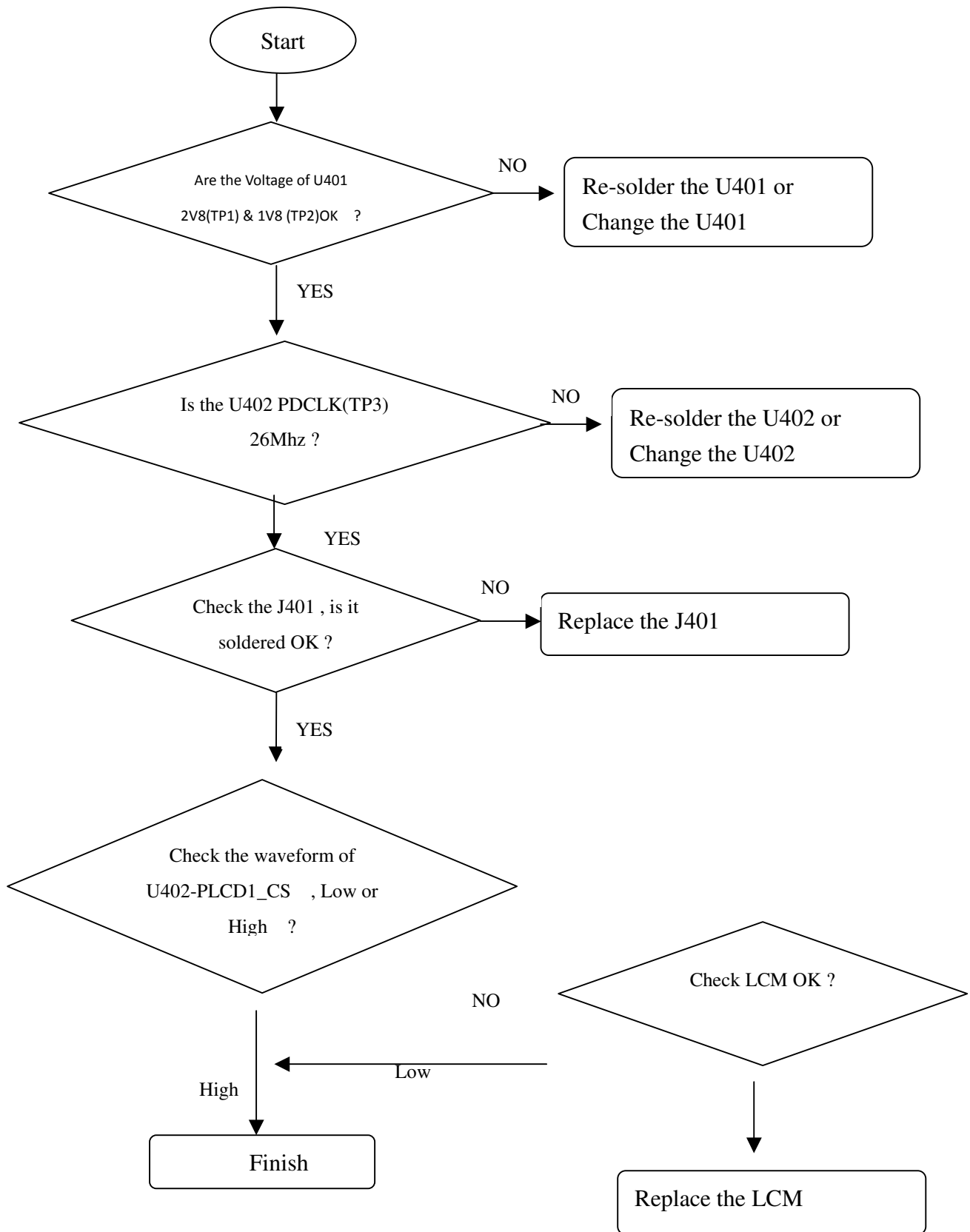
Test Pointer



Circuit Diagram

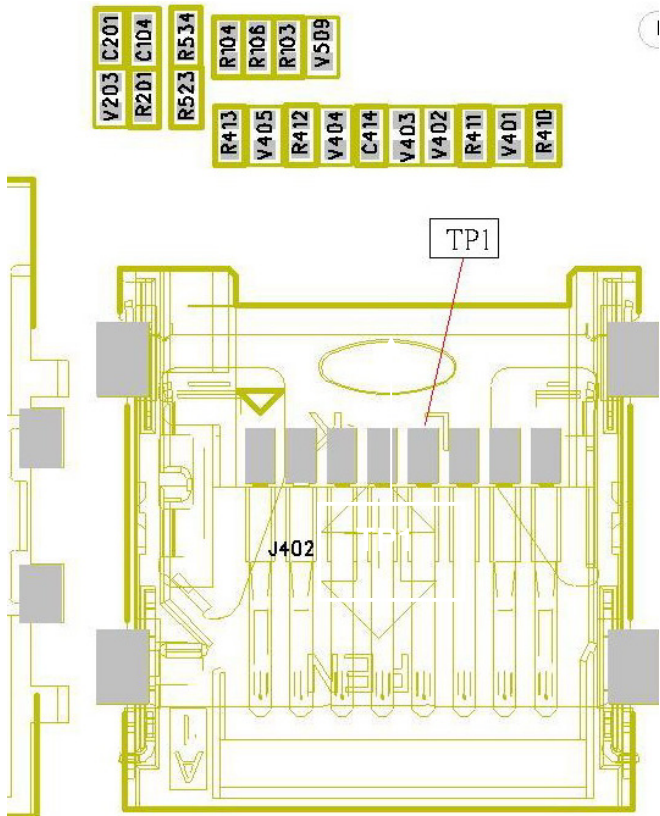


Checking Flow

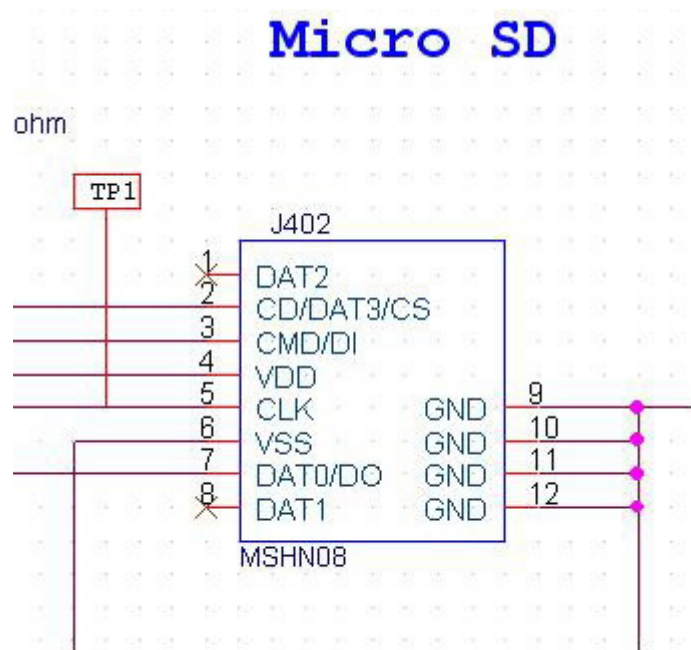


4.16 Micro SD Trouble

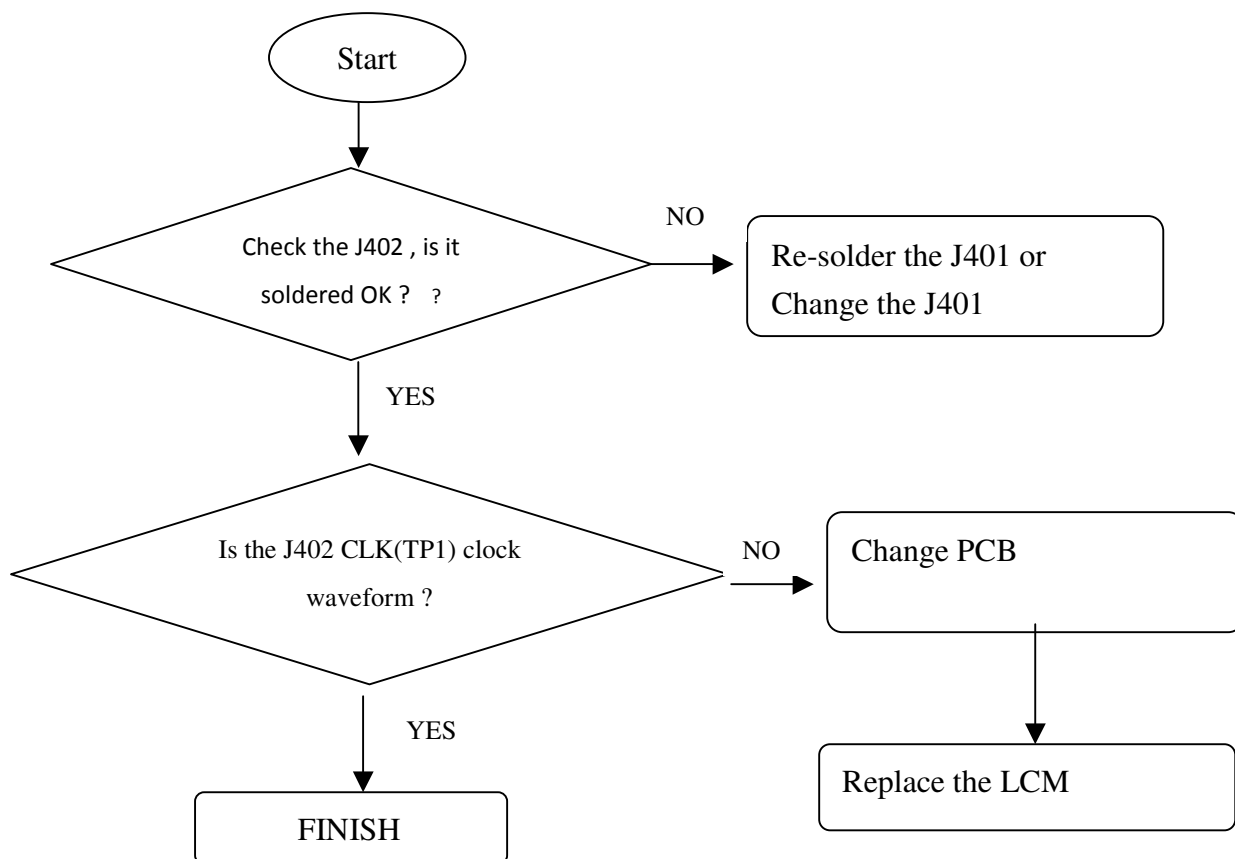
Test Pointer



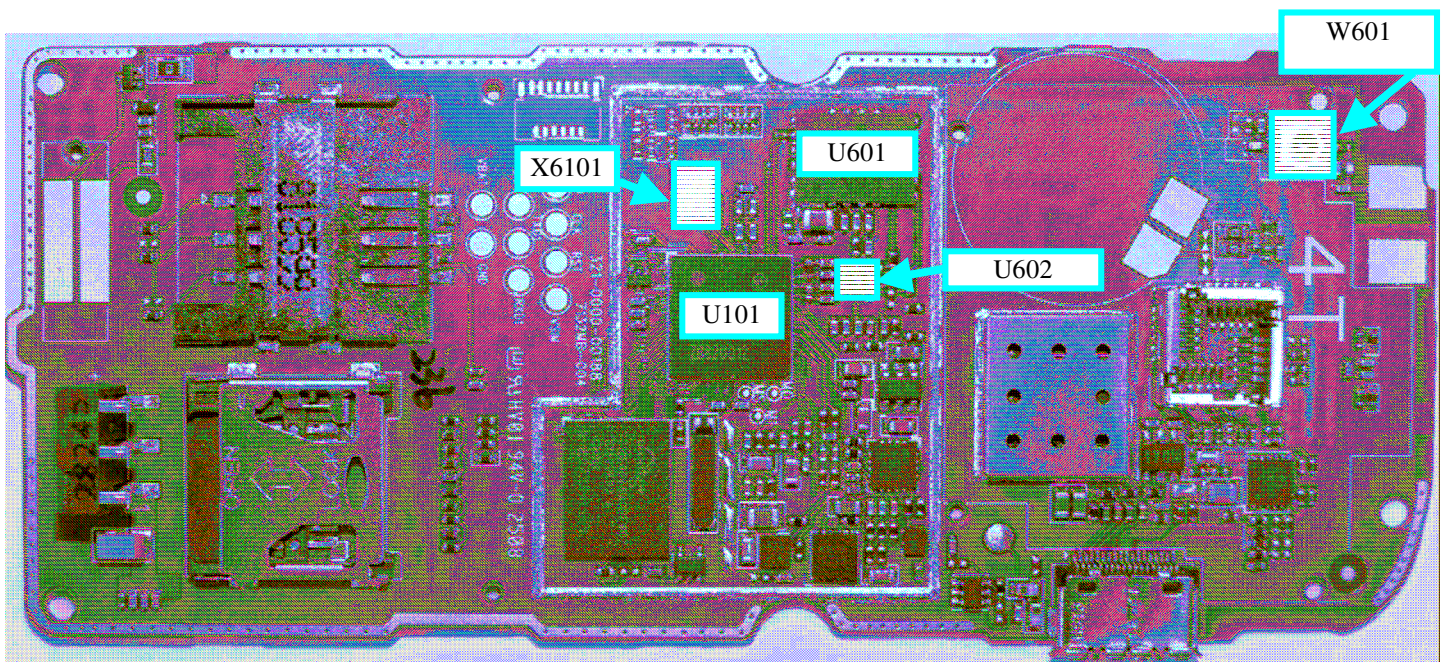
Circuit Diagram



Checking Flow



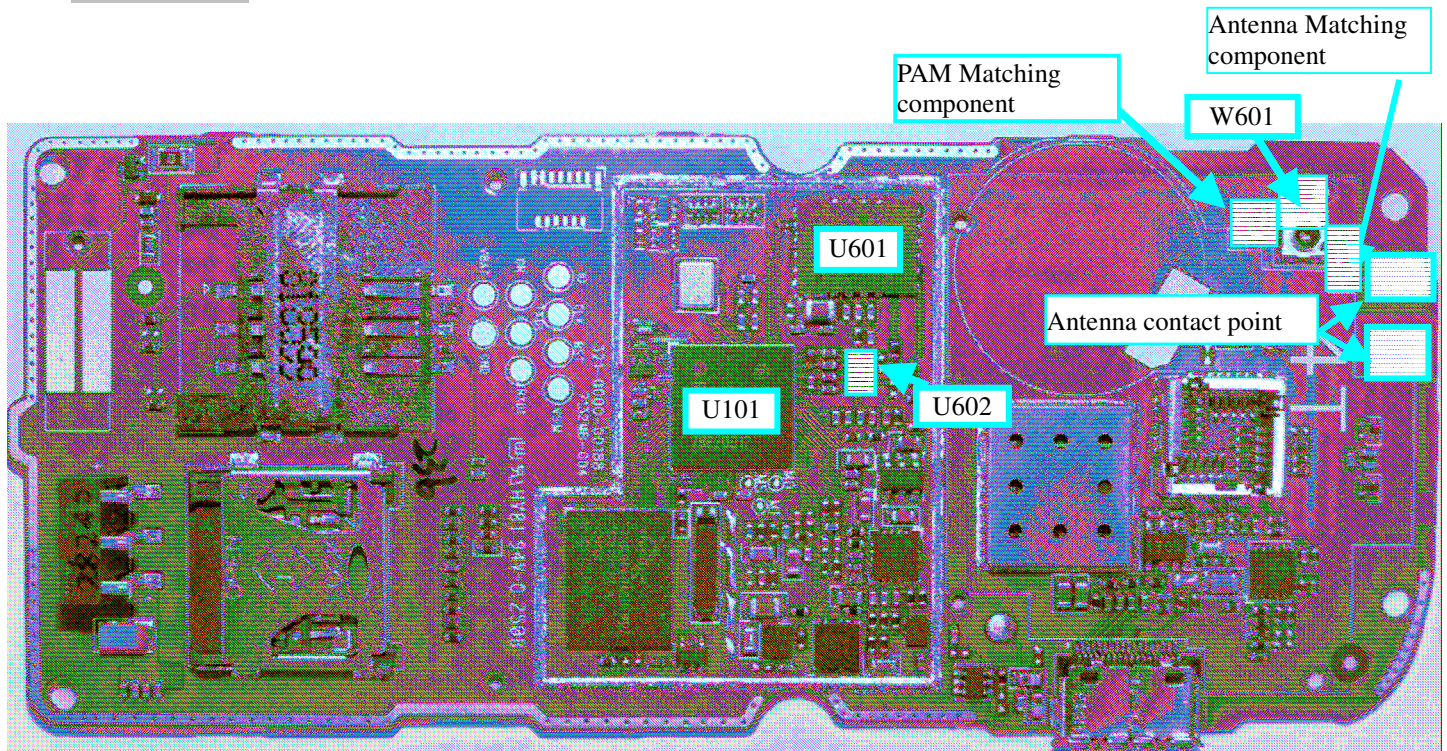
4.17 RF Trouble SHOOTING



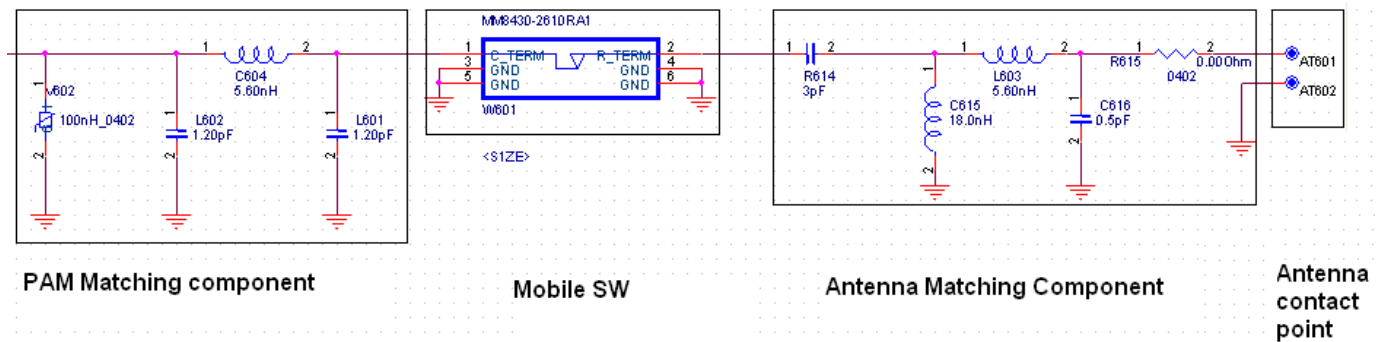
REFERENCE	PART Description
U601	PAM (Power Amp. Module+ASM)
X6101	DCXO (26MHz)
W601	Mobile Switch
U602	RX SAW Filter

RF Trouble

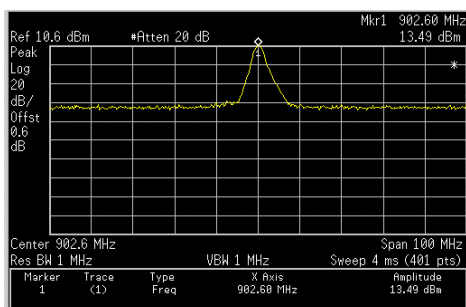
TEST POINT



CIRCUIT



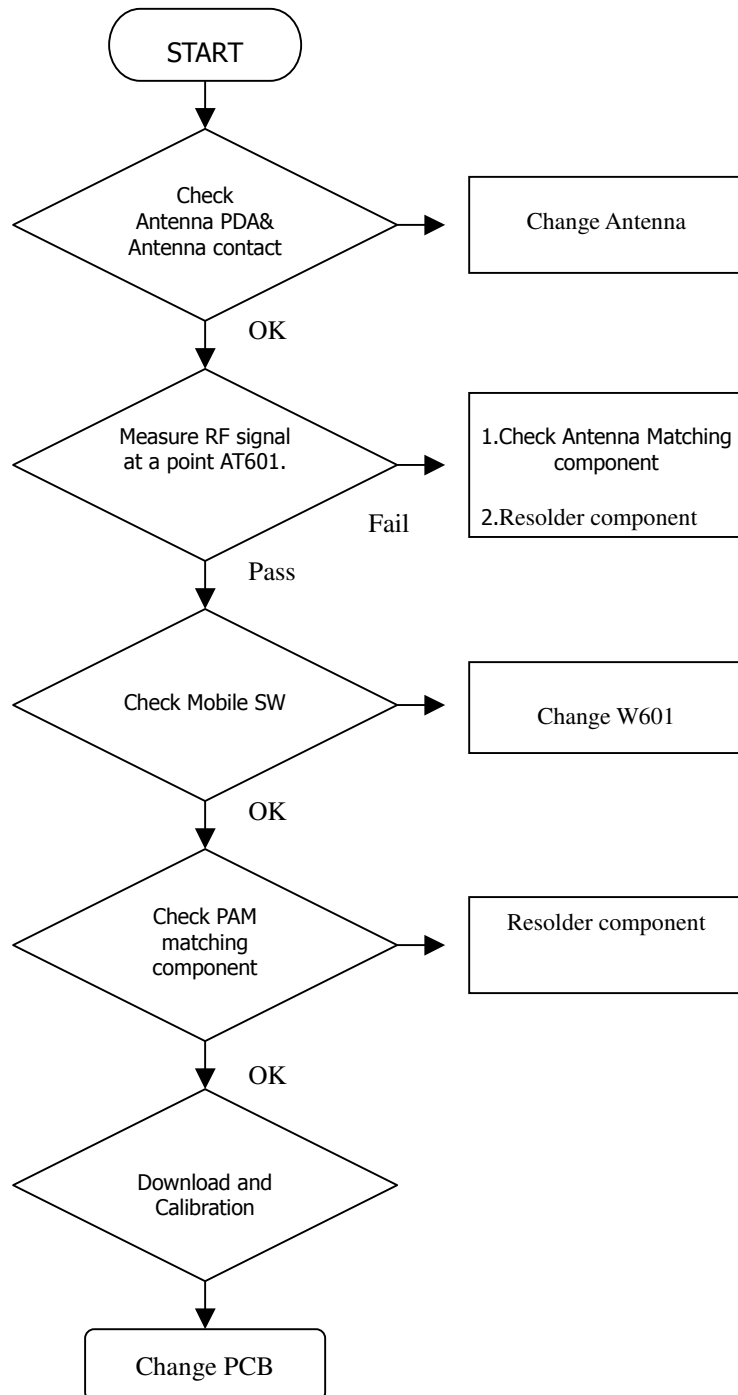
WAVE FORM



*RF output power in AT601,AT602

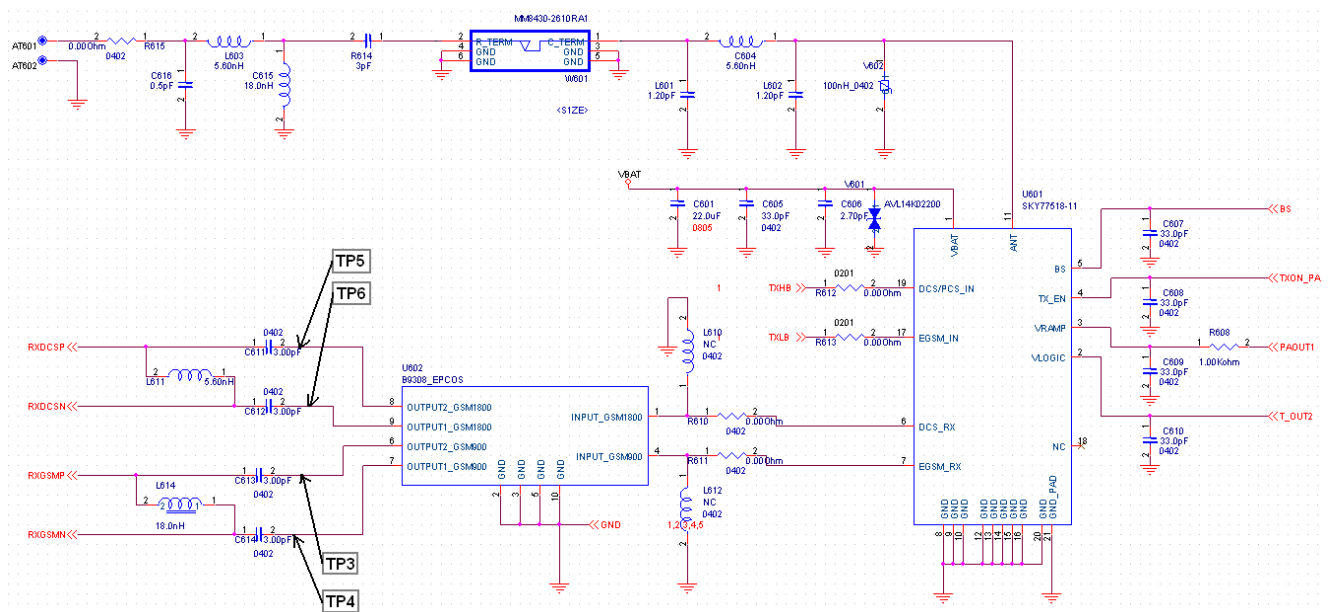
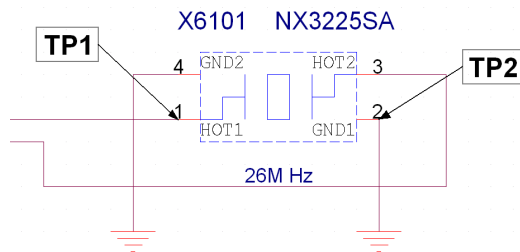
CHECKING FLOW

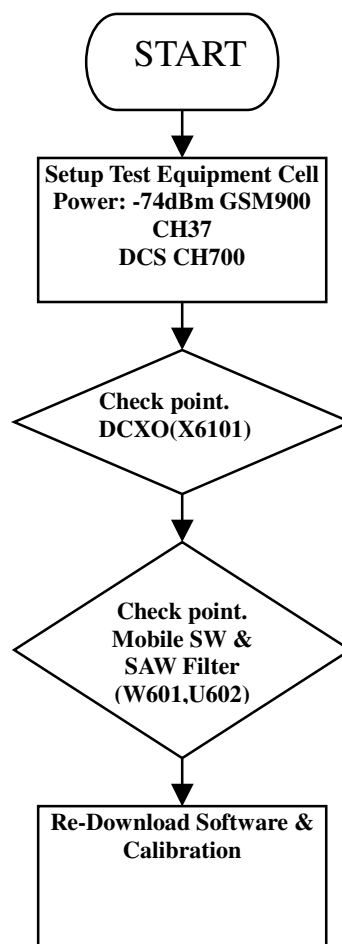
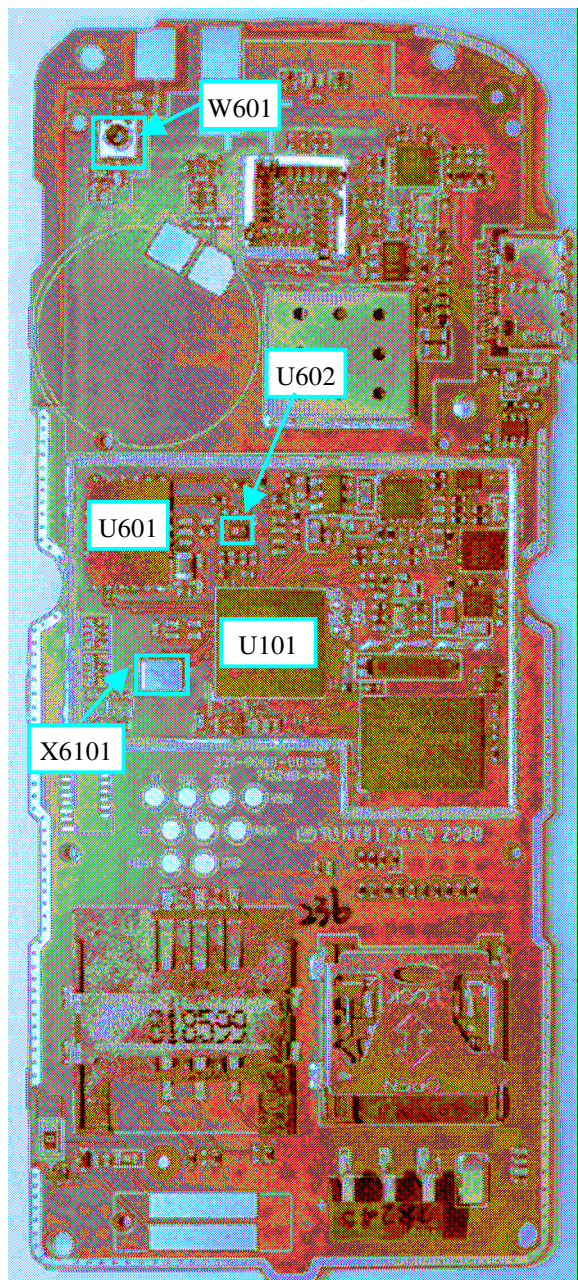
Check RF output power form PA in U601. An analog signal pass through PAM Matching components, SW(W601), Antenna Matching components and Antenna contact point. Then finally pass it on to main Antenna.

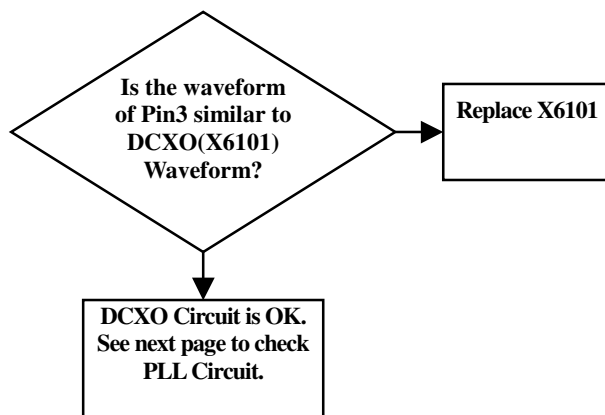
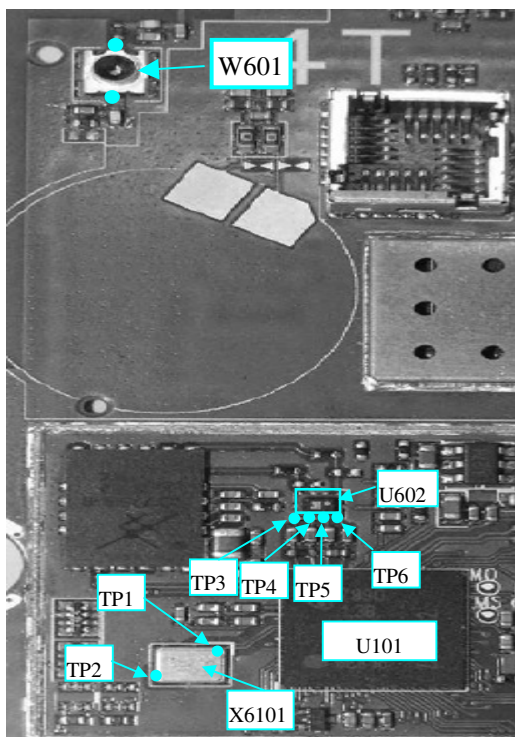


RX Trouble

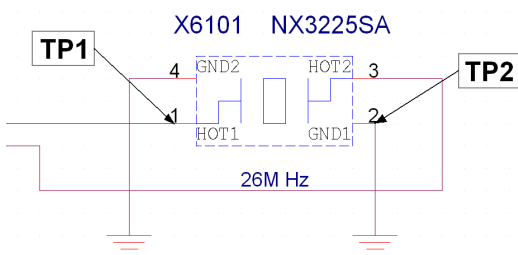
CIRCUIT



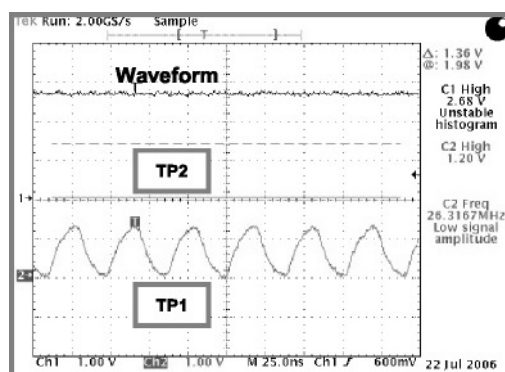




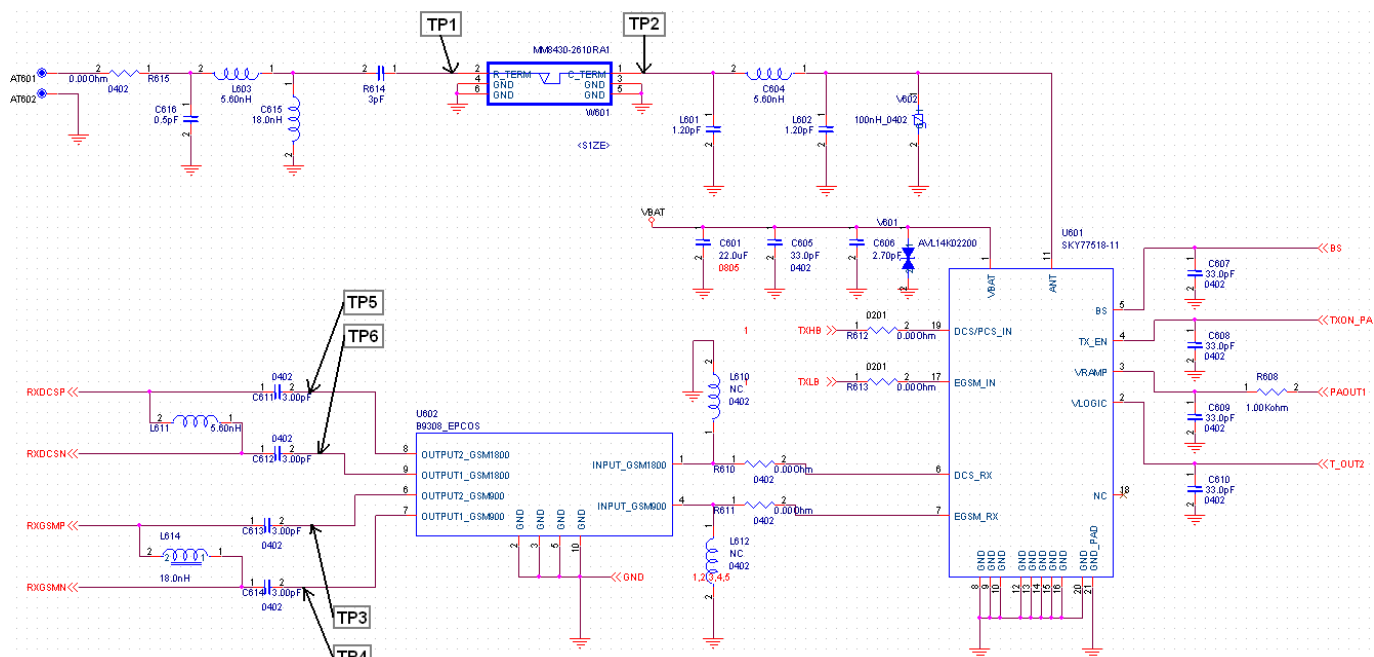
CIR CUIT

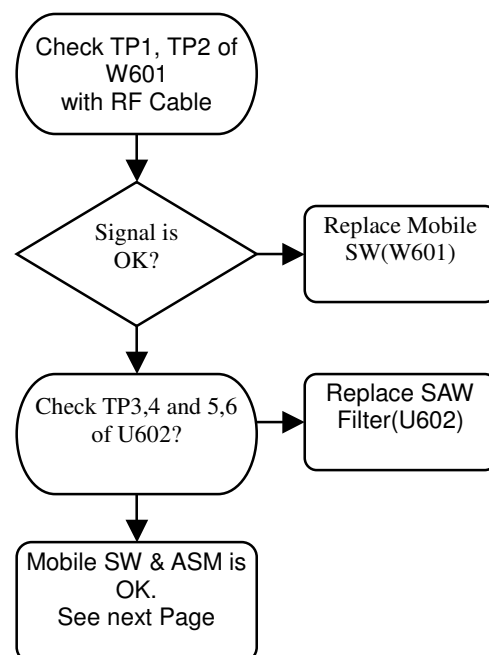
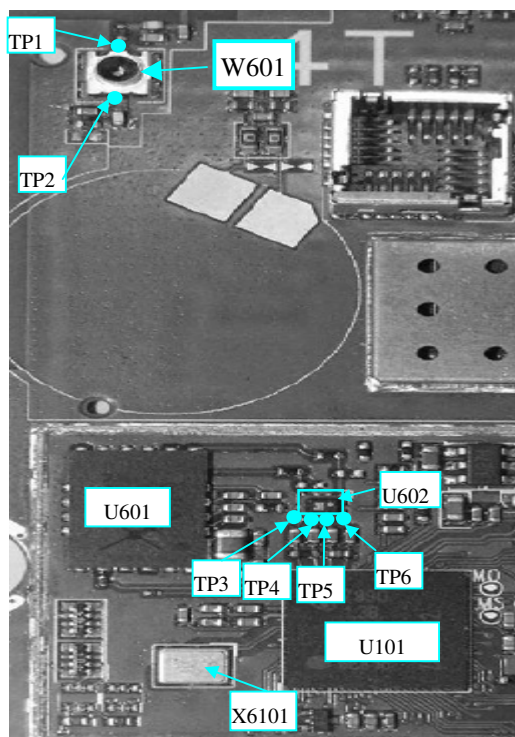


WAVE FORM



CIRCUIT

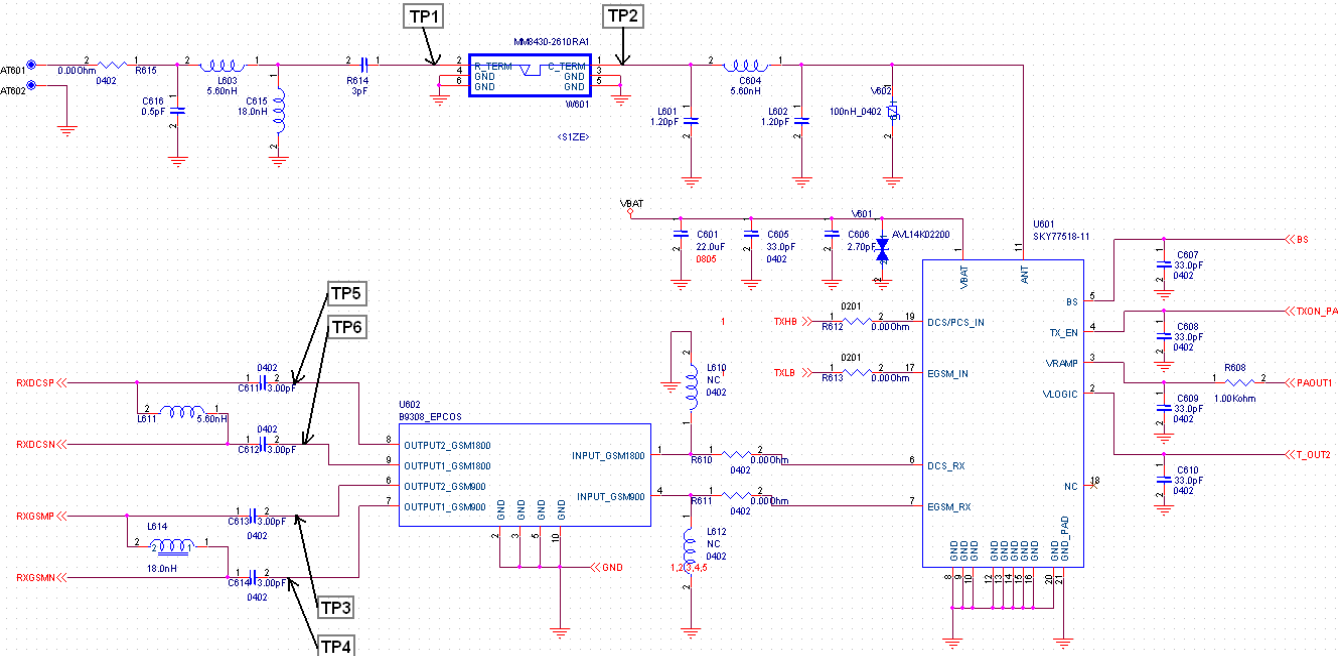


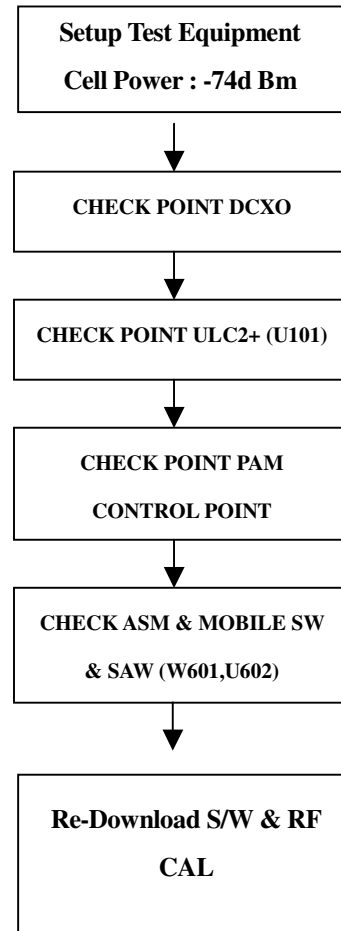
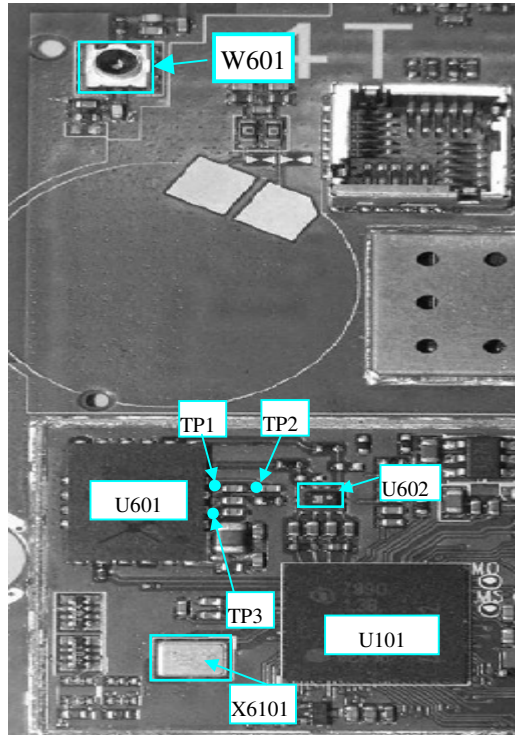


*** TP 3, 4 and 5, 6 outputs of U602 are balanced**

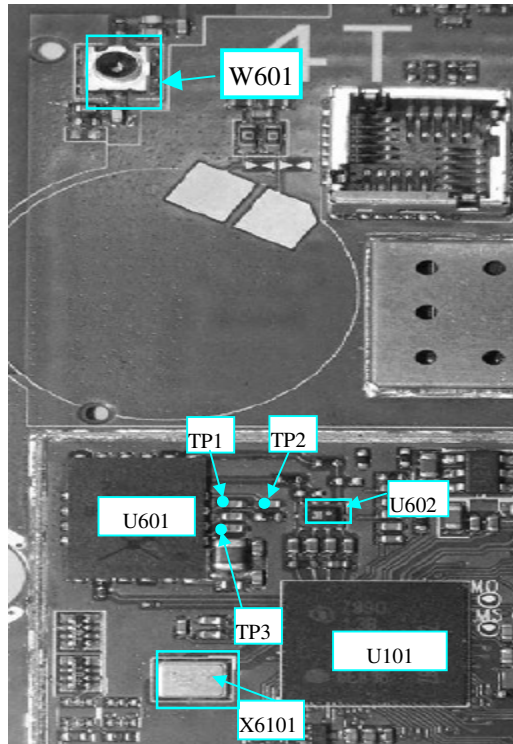
TX Trouble

CIRCUIT

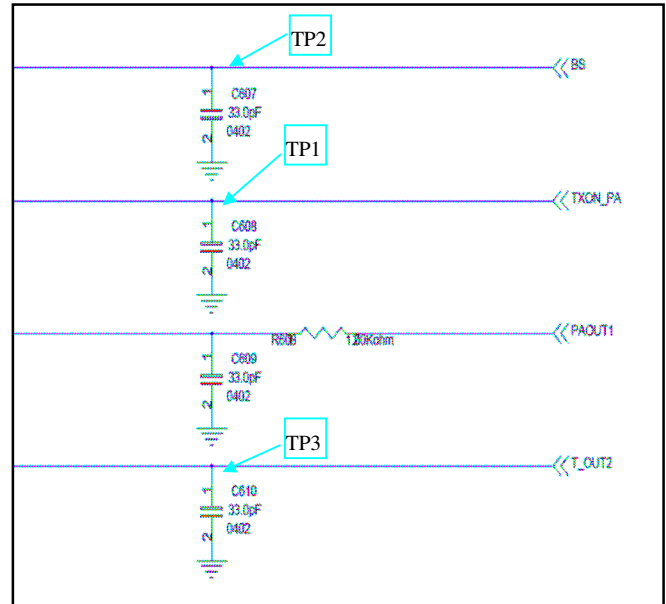




TEST POINT



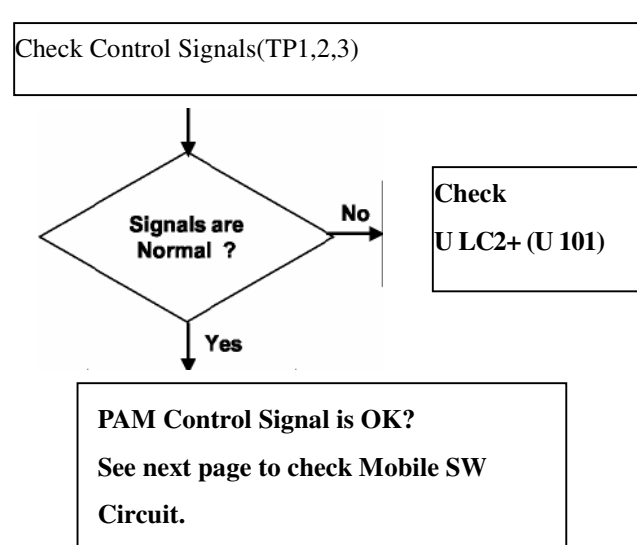
CIRCUIT



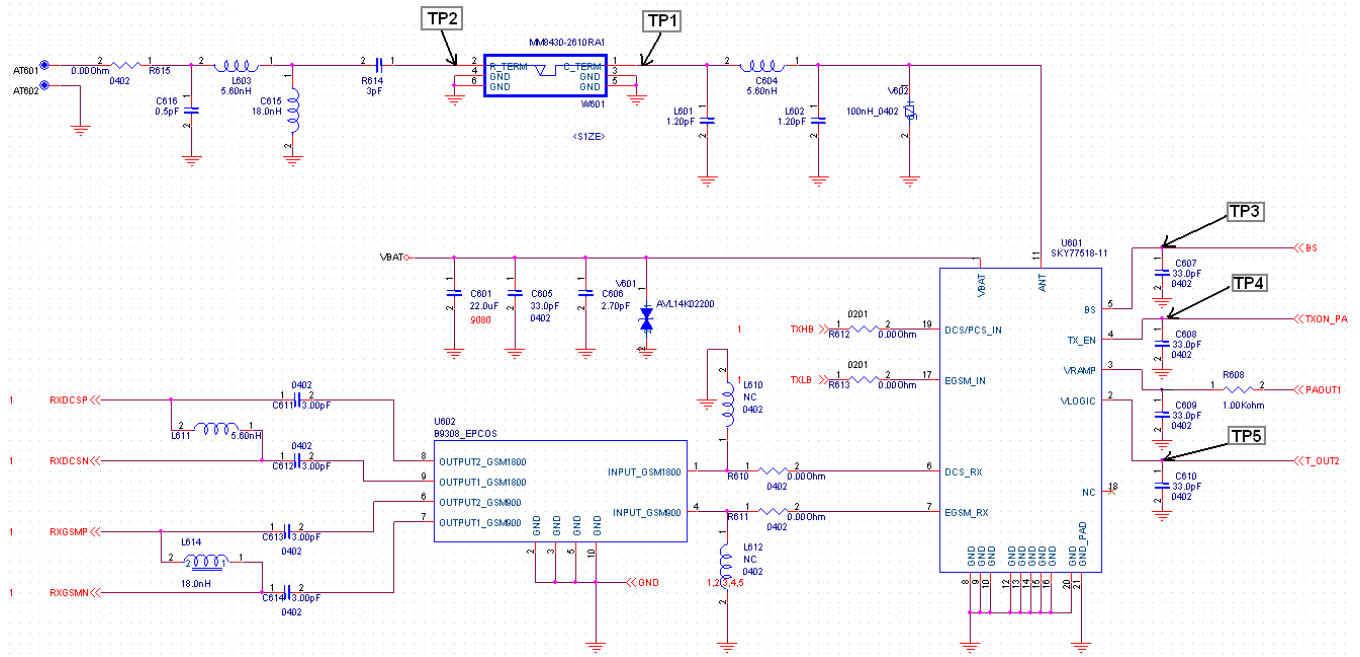
Signal configuration

Mode	GSM900 TX	DCS1800 TX
TXON_PA (TP1)	H(2.7V)	H(2.7V)
BS (TP2)	L	H(2.7V)
VLOGIC (TP3)	H(2.7V)	H(2.7V)

CHECKING FLOW

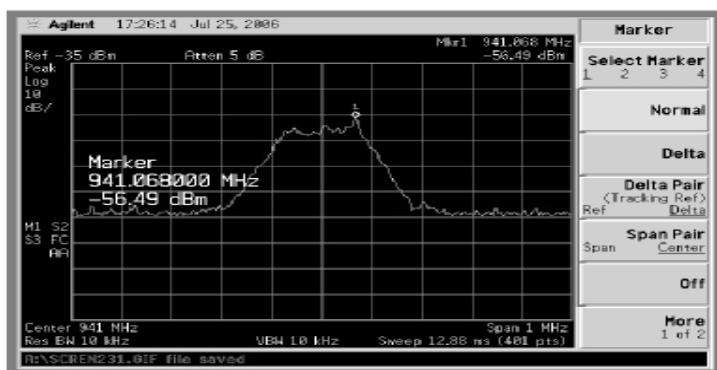
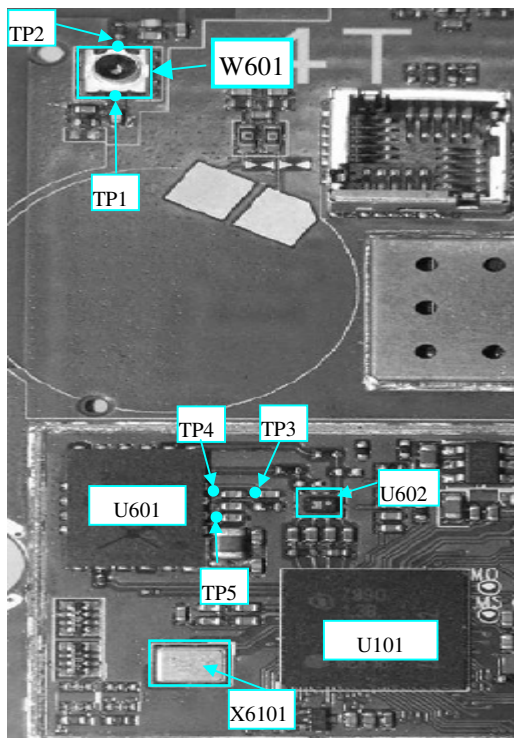


CIRCUIT

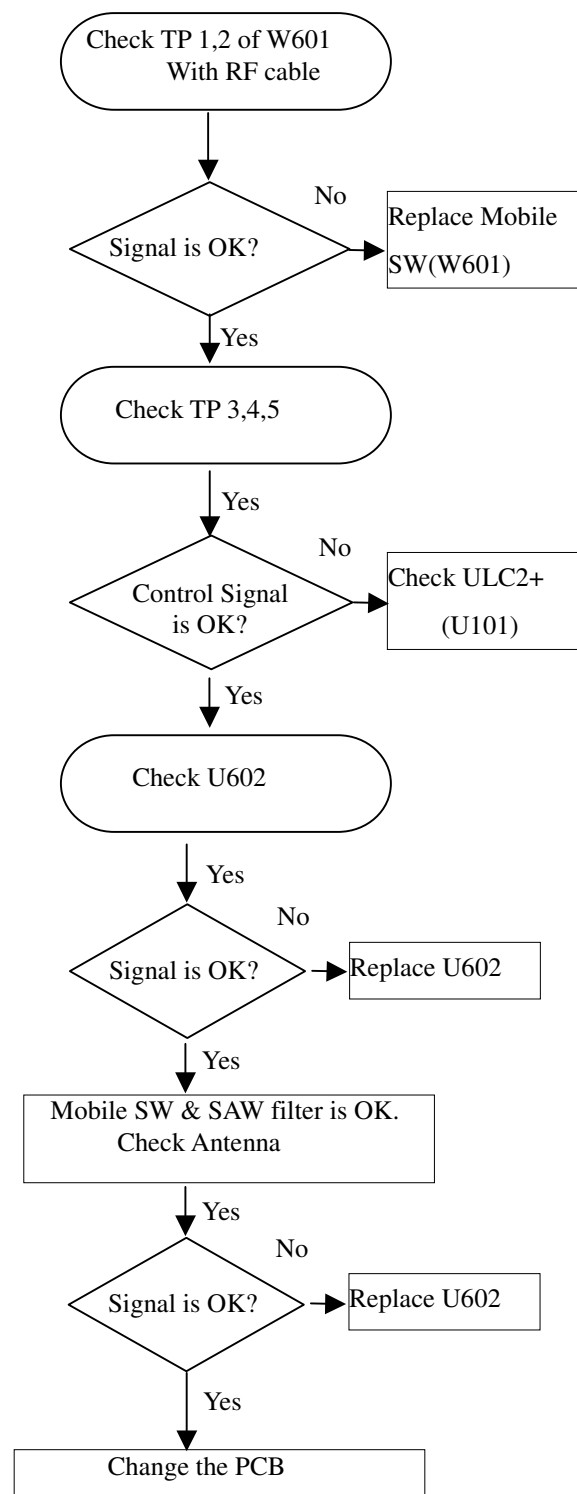


TEST POINT

CHECKING FLOW

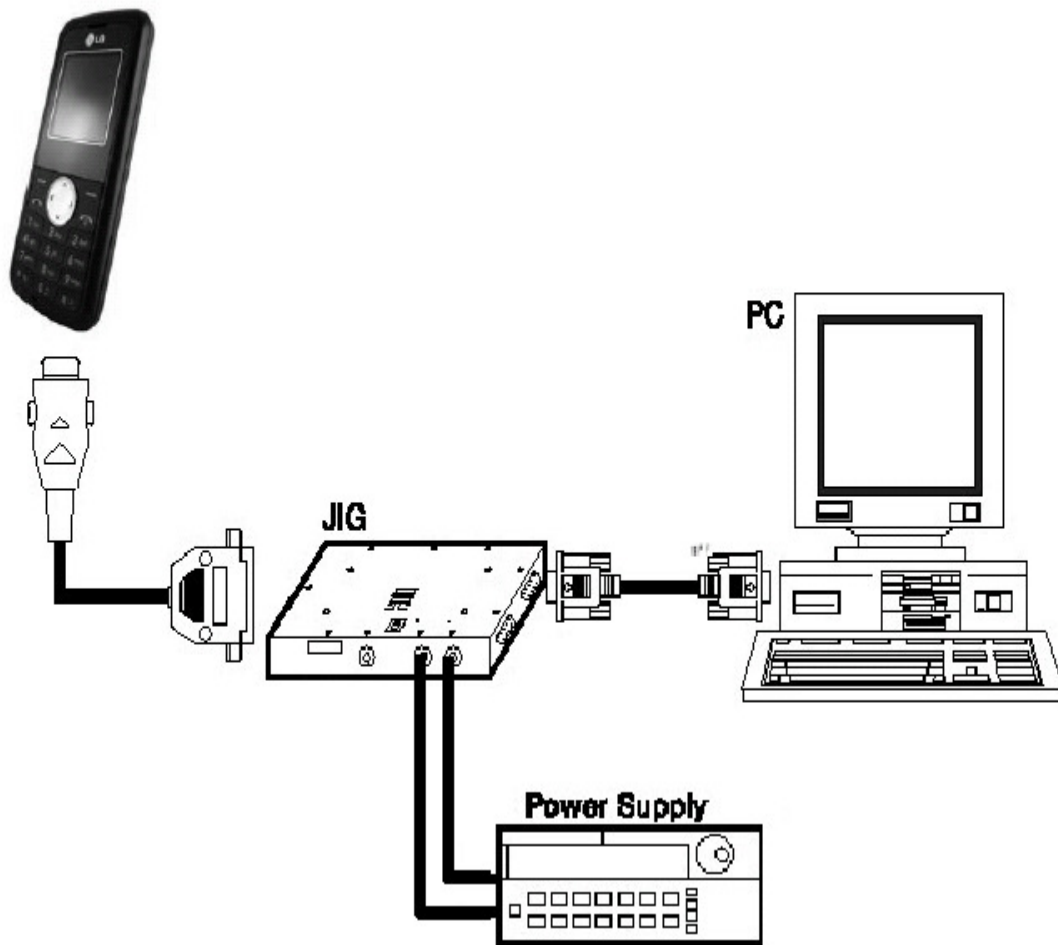


Mode	GSM900 RX	PCS1800 RX
VLOGIC (TP3)	H(2.7V)	H(2.7V)
TXON PA (TP4)	L	L
BS(TP5)	L	H(2.7V)



5.DOWNLOAD

5.1 Download Setup



5.2 Download tool

Installation

Installing this program before you must install “Prolific USB-to-Serial Comm Port” driver first. Install SetupDWForService.msi when driver installing is Okay.

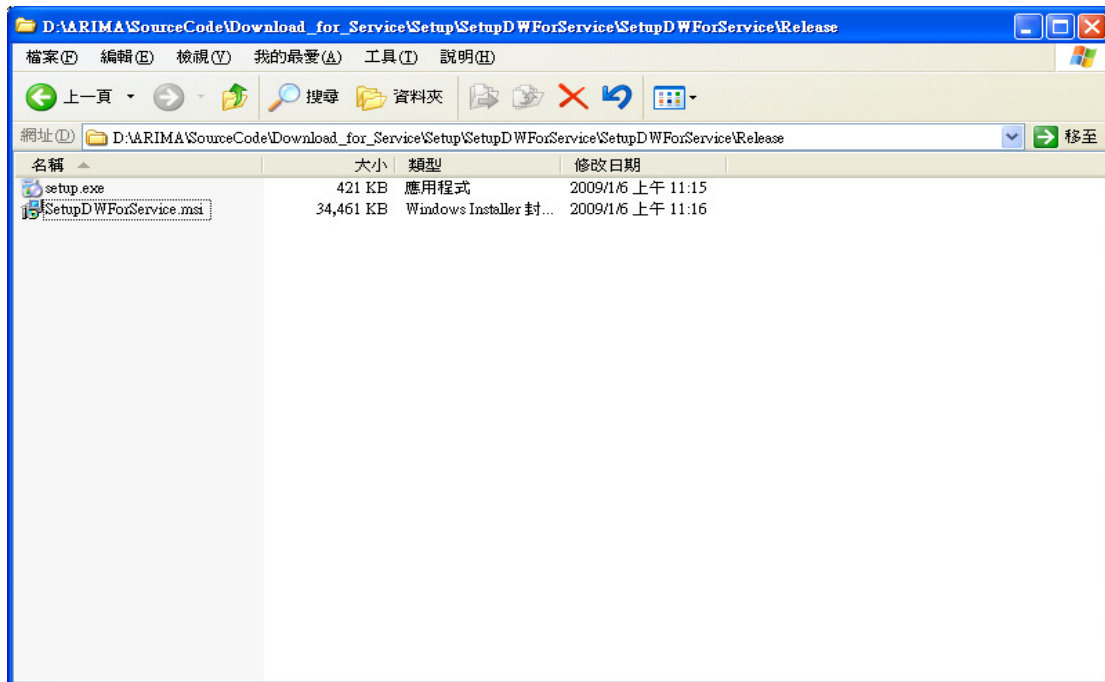


Fig.1 DownLoad installing

Click “Next” button to continue. ◦



Fig.2 Welcome Screen

Choose a item of what you want. Click “Next” button to continue.

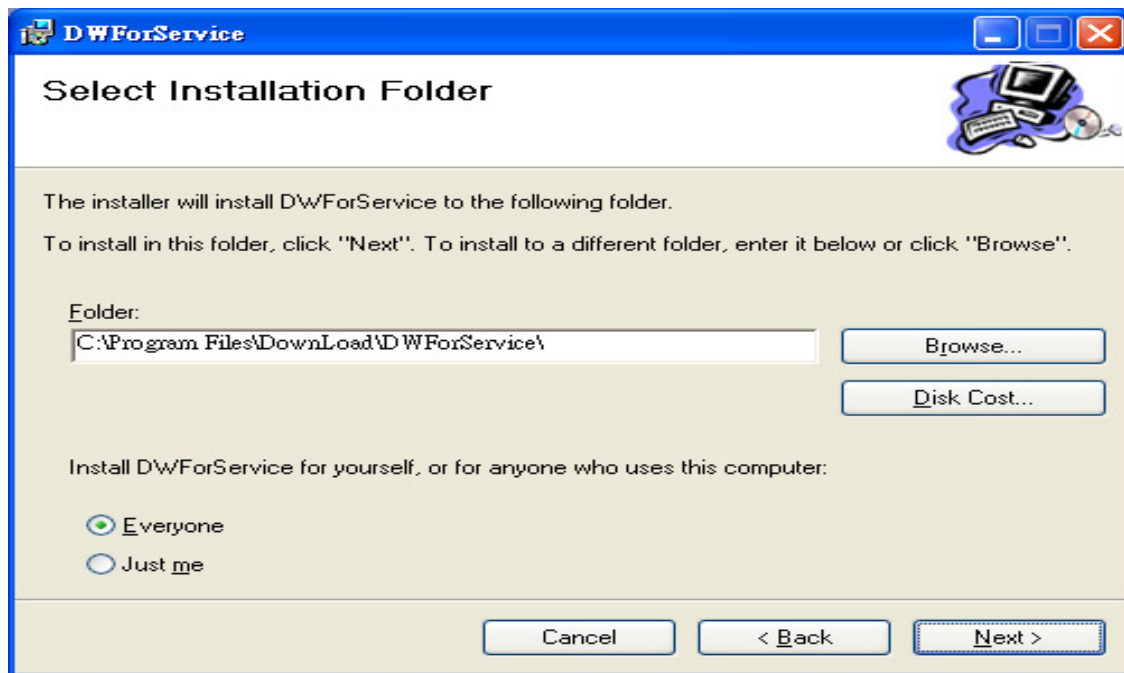


Fig.3 Choose a item

Make sure of setup is correct , Click “Next” Button to Start installing.

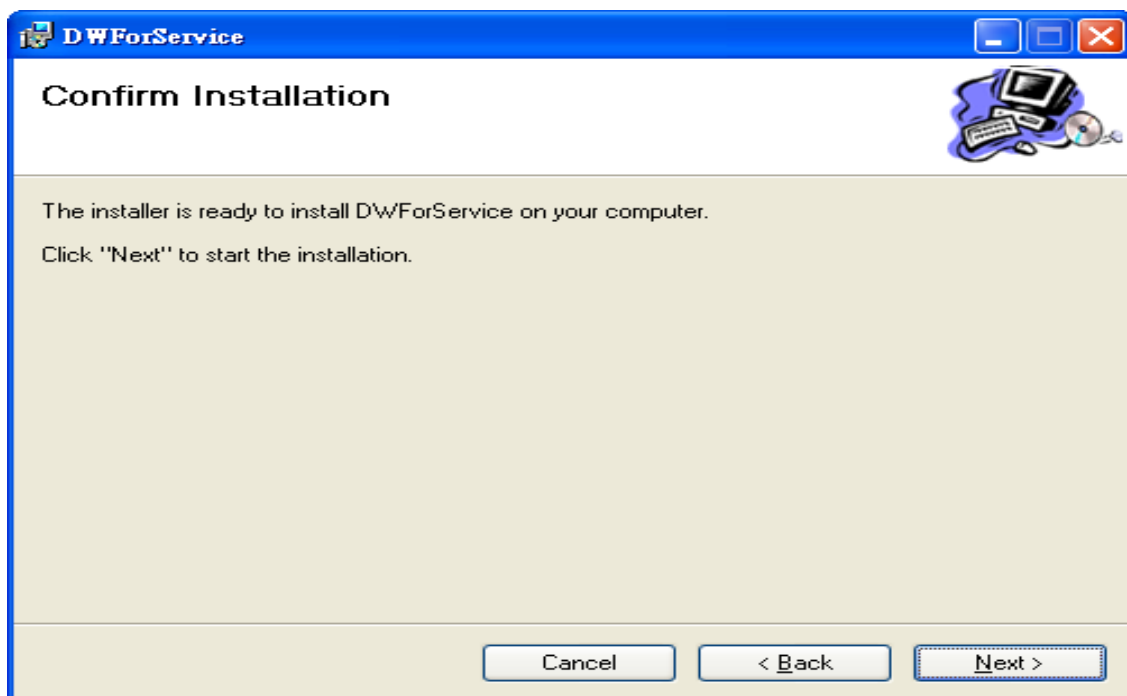


Fig.4 Installing directory

Installation finish, Click “Close” button to finish.

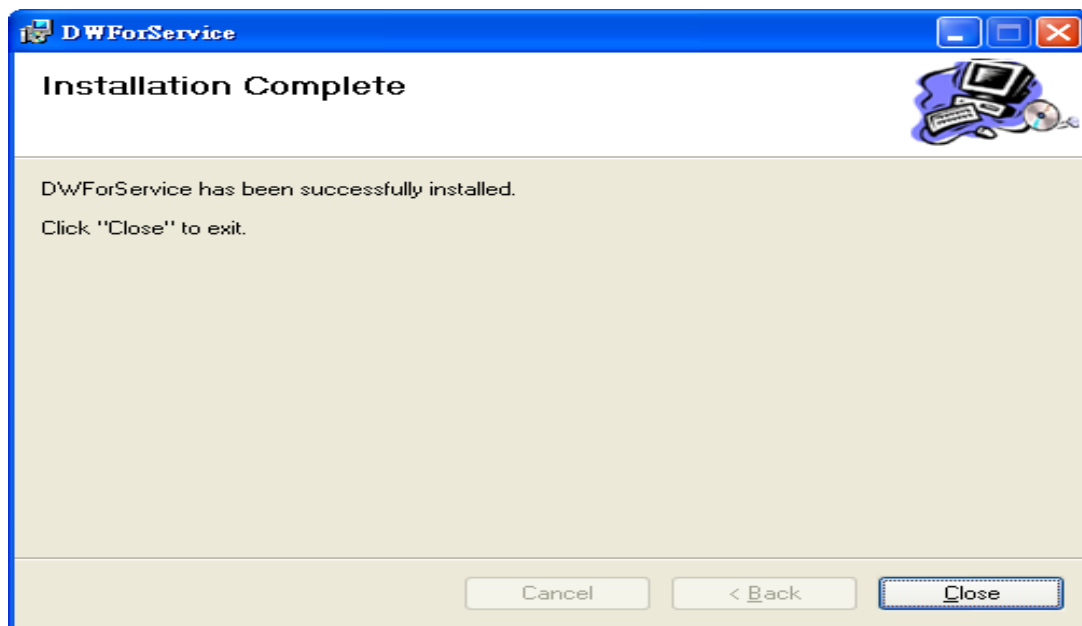


Fig.5 Installation finish

If you want to remove this software ,please go to “Console” and choose “add/remove Install” to remove DWForService .



Fig.6 Remove DWForService screen

It will present a shortcut in the desktop after installing finish.



This is DWForService download software.

User Interface for Service

Will present the screen of follows after executing the software. Description as follows.

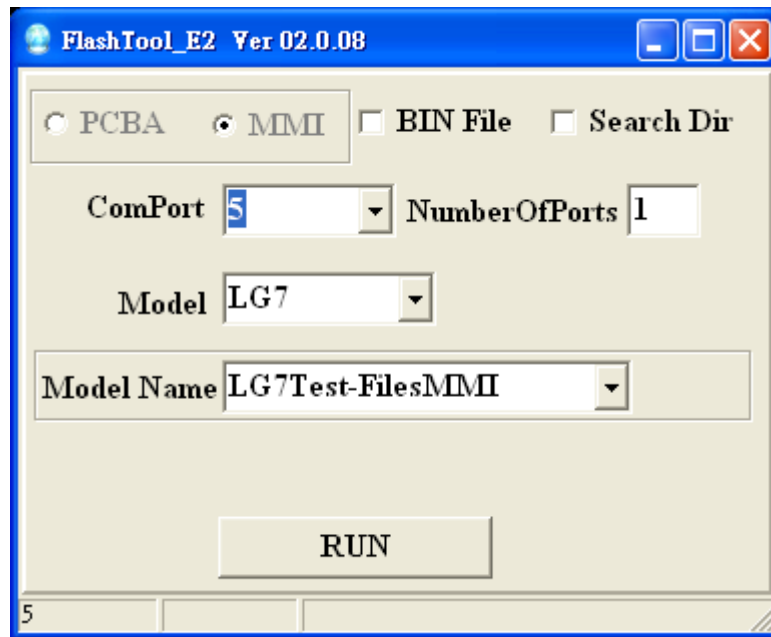


Fig.7 User Interface

1. PCBA item is for Re-format the PCBA with Calibration. (It will write **.fls** **.eep** **.cust** files to phone).

MMI item is for Upgrade customization SW only , no need to calibration.(It will write **.fls** **.dffb** **.cust** files to phone).

PS: If you want change it please see “**4.Modify setting** [page 11]”

2. Choose “Bin file” to use .BIN file.
Choose “Search Dir” to use .fls, eep, dffb, cust files.
3. Choose Comport number.
4. Choose Model and Model Name.
5. Click “RUN” button to execute.

Download flow

Start Download

Will present download window after make sure of setting no error.

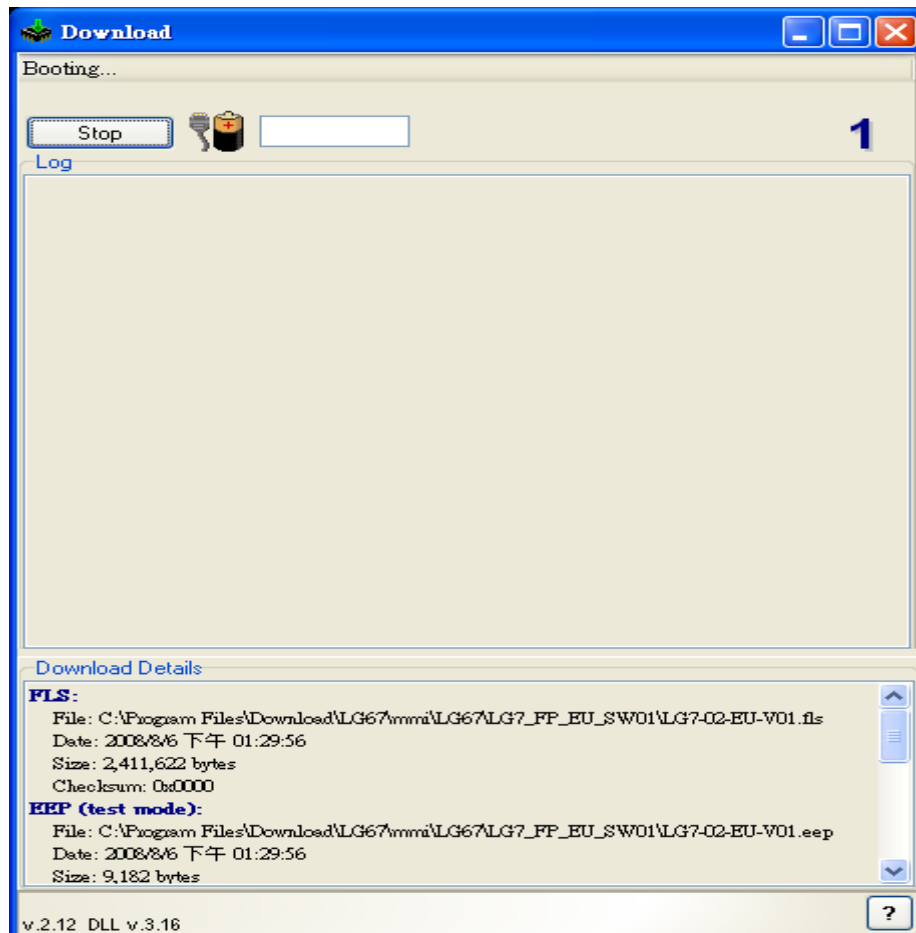


Fig.8 Prepare download screen

When appear above picture. Will automatic execute download program after DUT open power.

Downloading

Download program will according to software download. Every software will display in List.

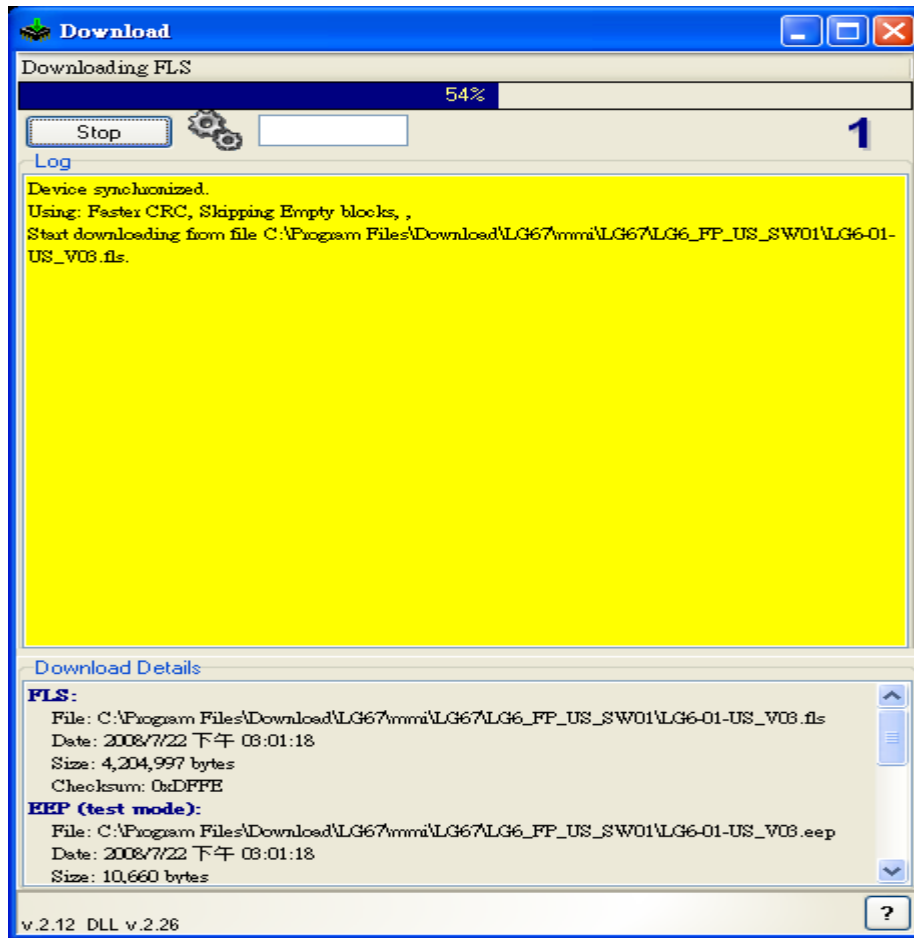


Fig.9 Downloading screen

DownLoad Fail

If download fail that it will show red and display progress in log window ◦

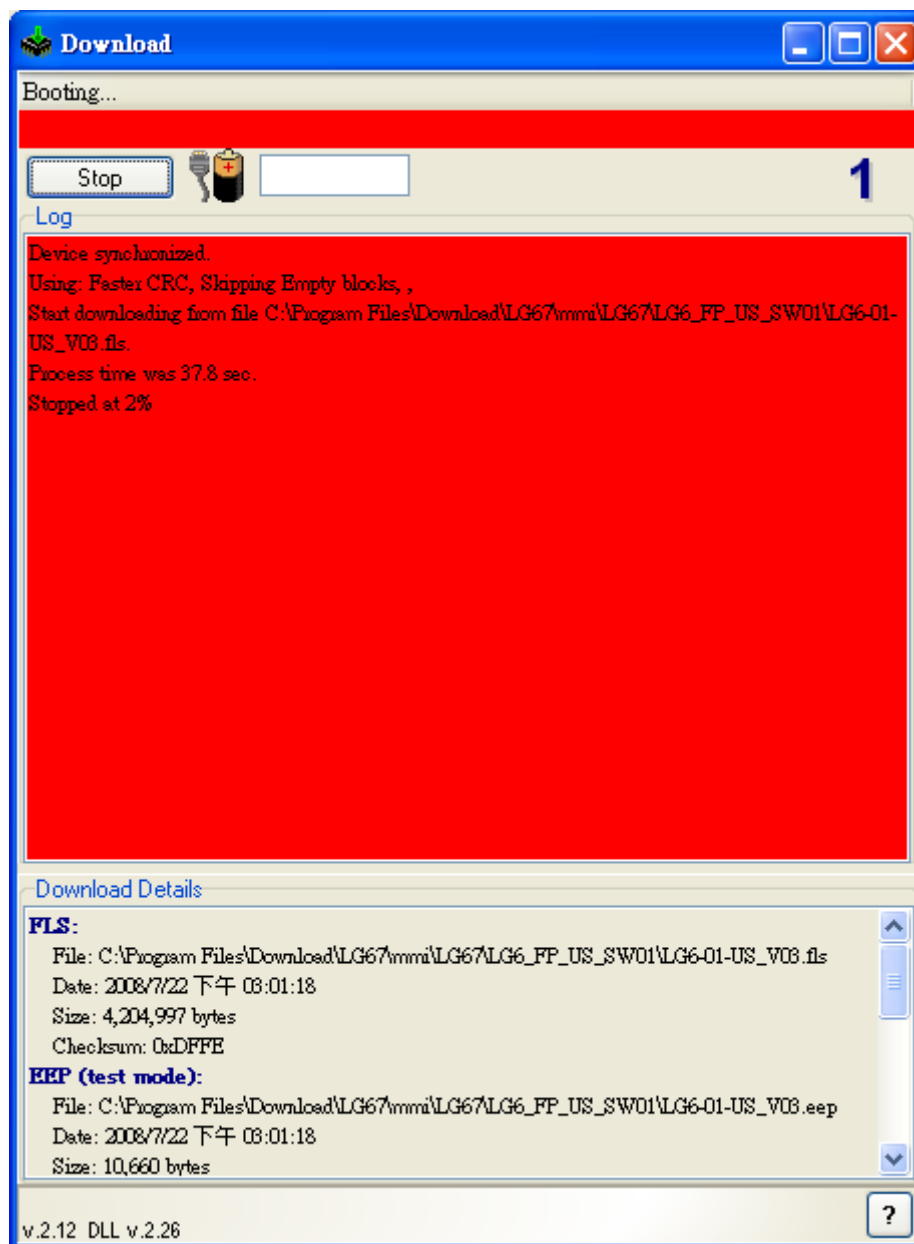


Fig.10 Download fail screen

Download success

Download Pass will display green color ◦



Fig.11 download success

Modify setting

DownLoad program have ini file to modify (“LGDownLoad.ini”) °

If you want to add new model or updated please to see follows red words.

This sample is for to create LG6 GB105A model , as follows.

[SoftWare]

PCBAPath=PCBA\LG67

MMIPath=MMI\LG67

[Model_LG6_PCBA]

GB105A=LG6A-02-US-V02

GB100A=LG6A-02-US-V02

GB105B=LG6A-02-EU-V02

GB100B=LG6A-02-EU-V02

GB107A=LG6B-02-US-V02

GB101A=LG6B-02-US-V02

GB107B=LG6B-02-EU-V02

GB101B=LG6B-02-EU-V02

GB105=LG6A-02-EU-V02

GB106=LG6A-02-EU-V02

GB100=LG6A-02-EU-V02

GB107=LG6B-02-EU-V02

GB101=LG6B-02-EU-V02

[Model_LG7_PCBA]

GB110=LG7V_EP2_V03

[Model_LG6_MMI]

GB105A=LG6A-02-US-V02

GB100A=LG6A-02-US-V02

GB105B=LG6A-02-EU-V02

GBMMI=LG6A-02-EU-V02

[Model_LG7_MMI]

GB110=LG7V_EP2_V03

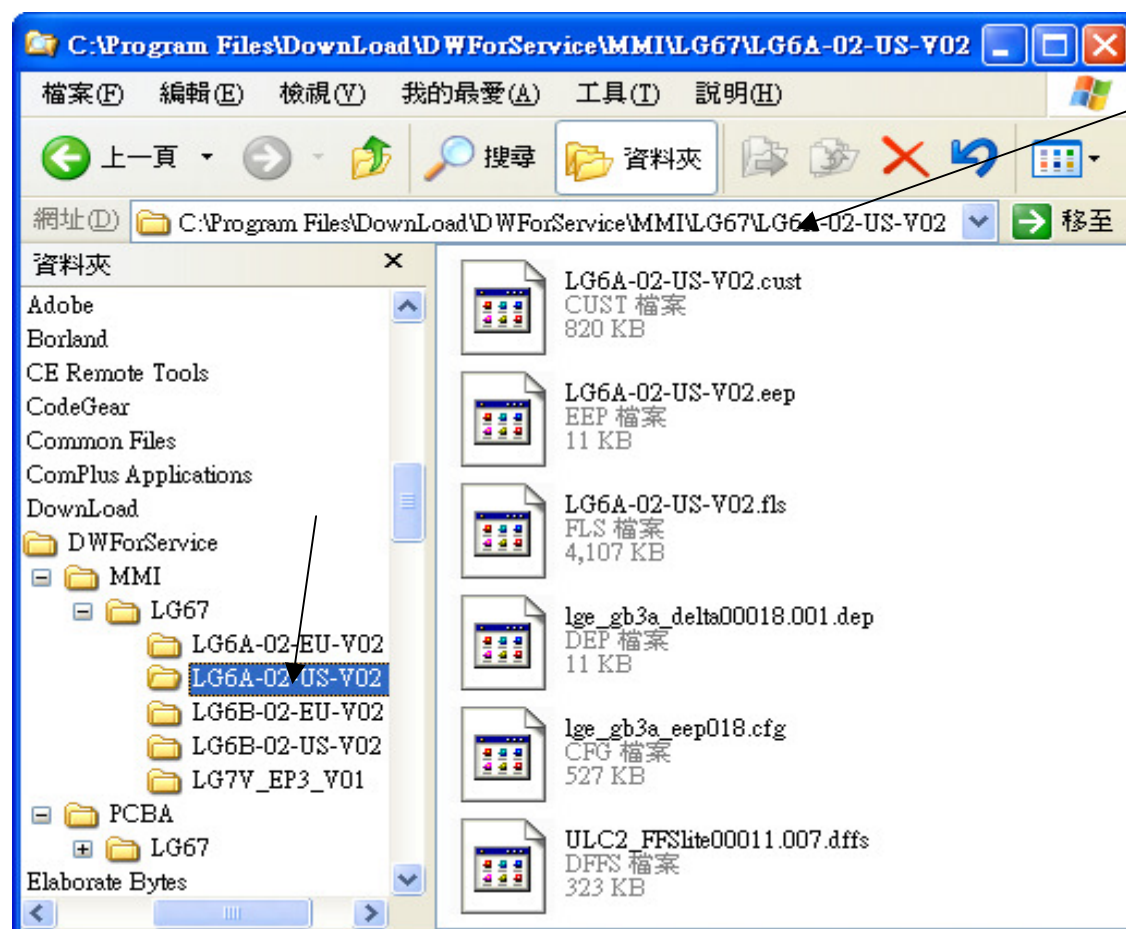
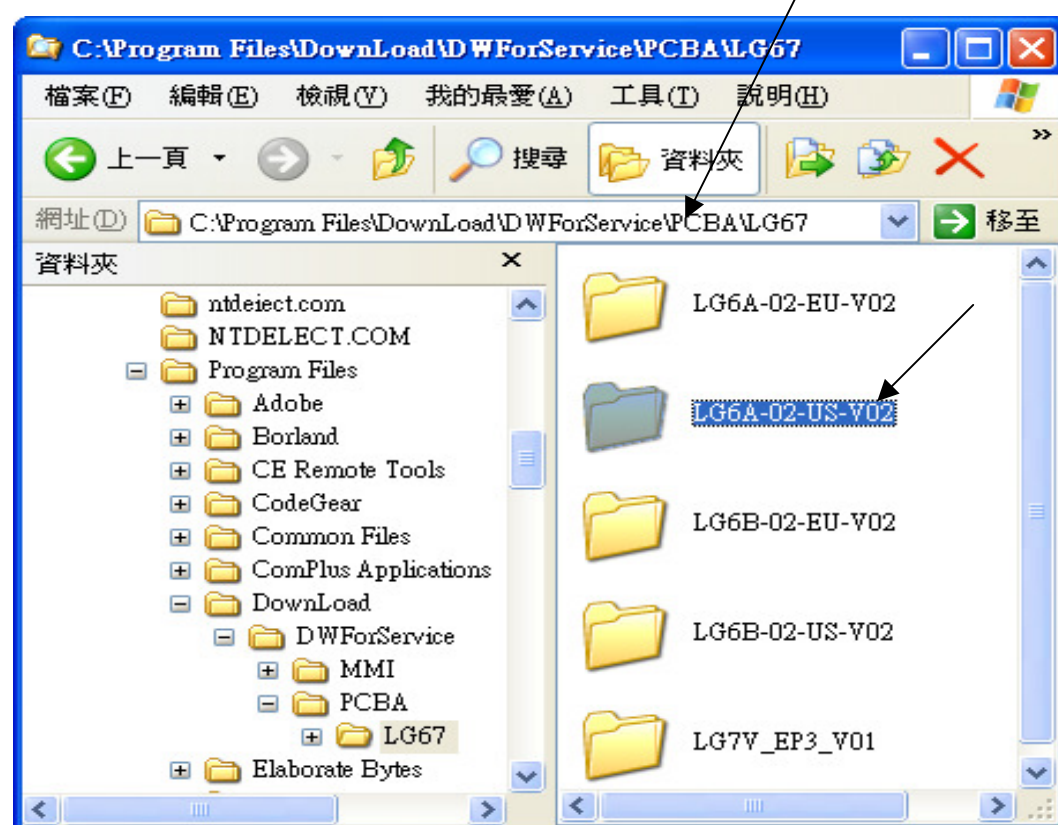
GBMMI=LG7V_EP2_V03

[Model]

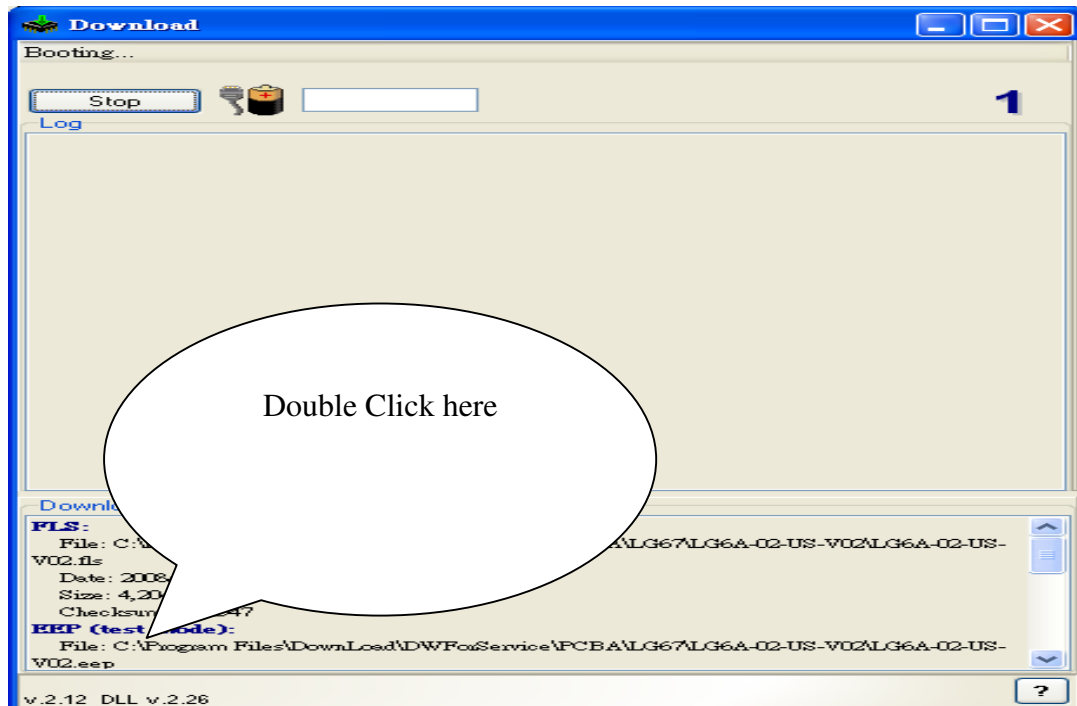
01=LG6

02=LG7

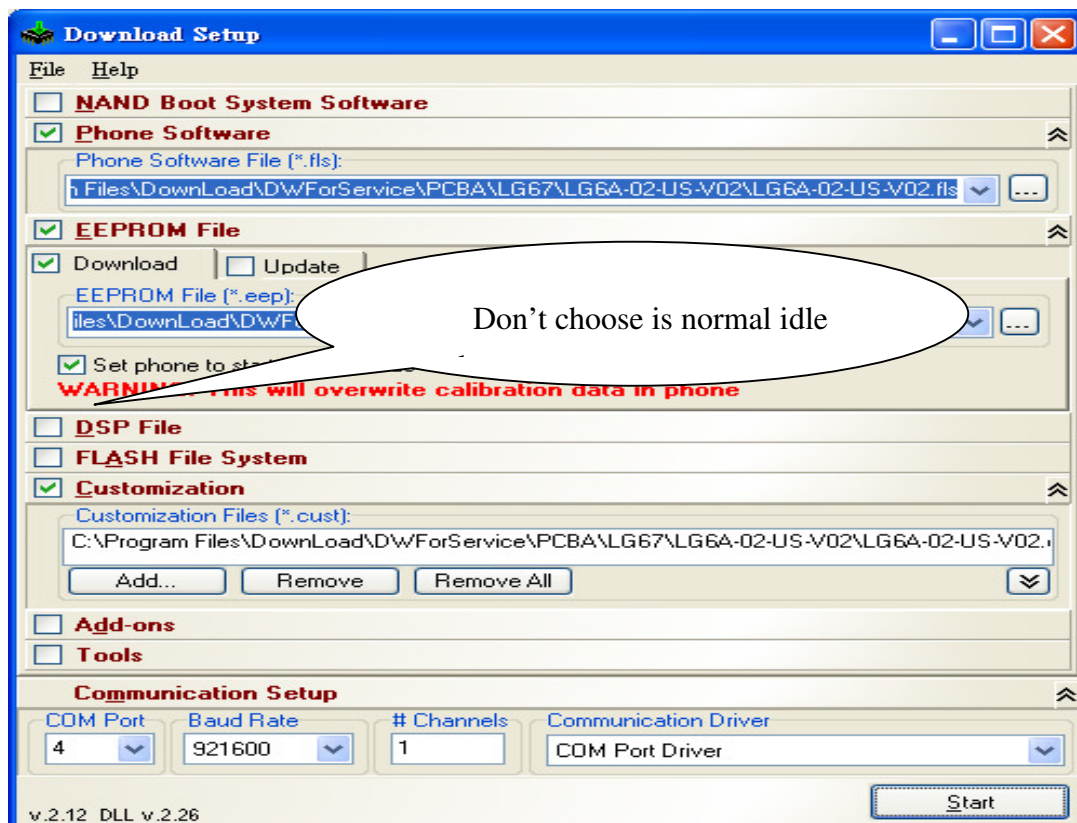
Add software files in folder as follows.



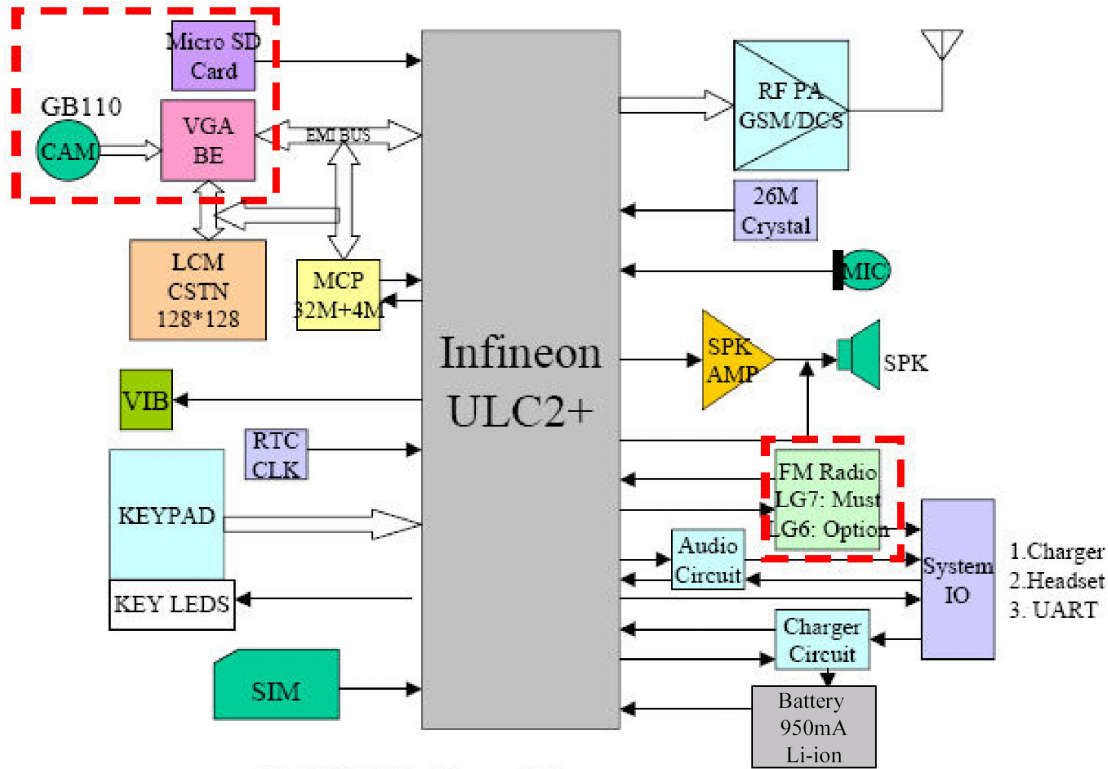
PS: Tab “PCBA” download Manual setup Parameter as follows.



Will appear follows screen after double click Download details component.

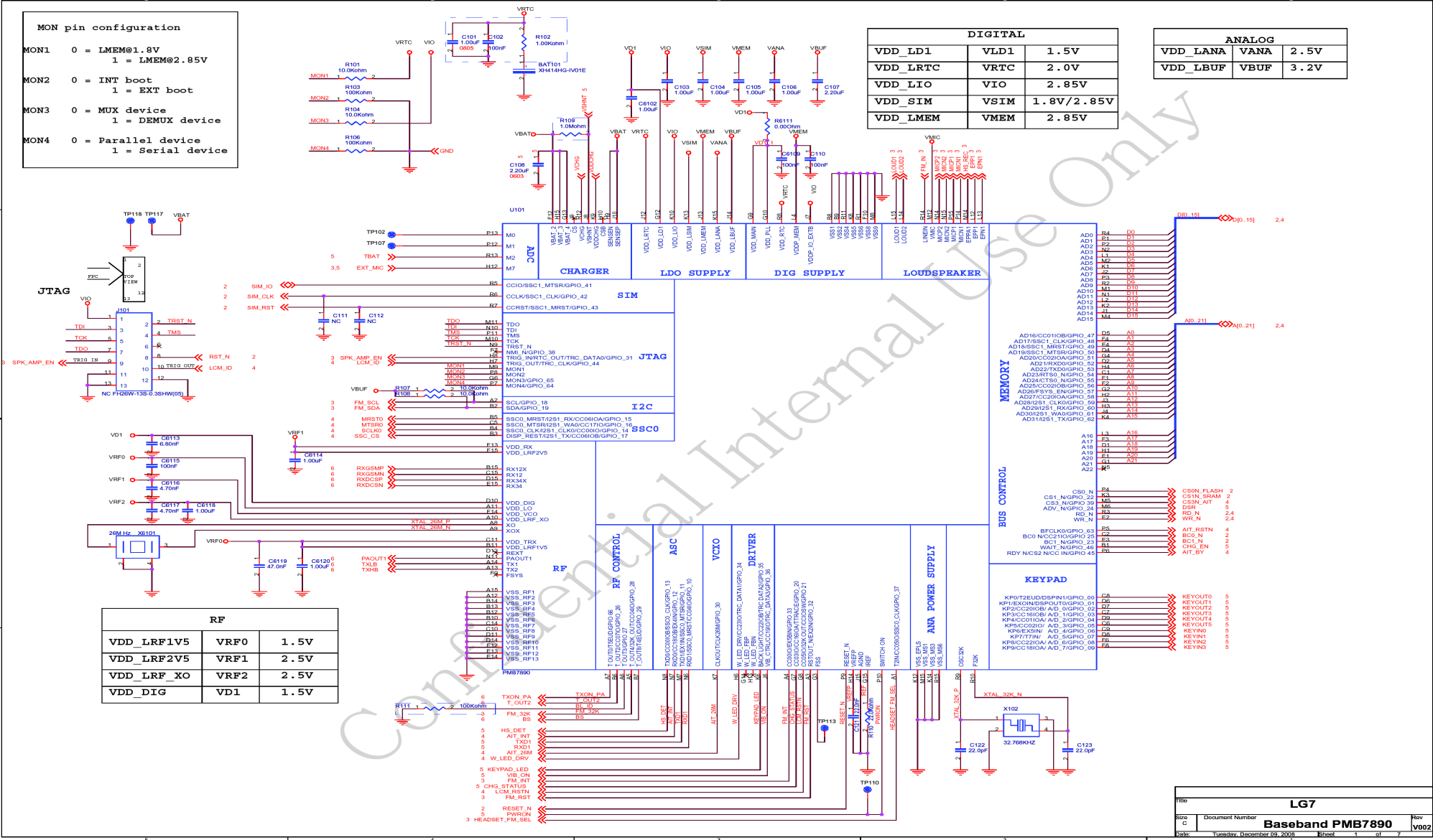


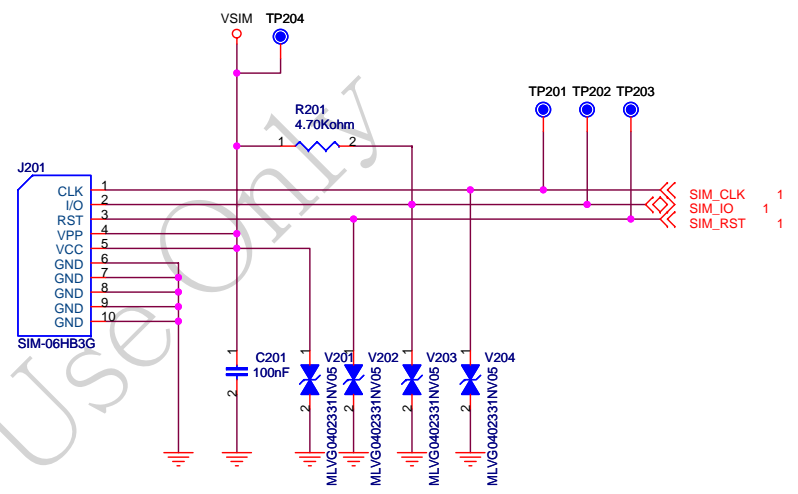
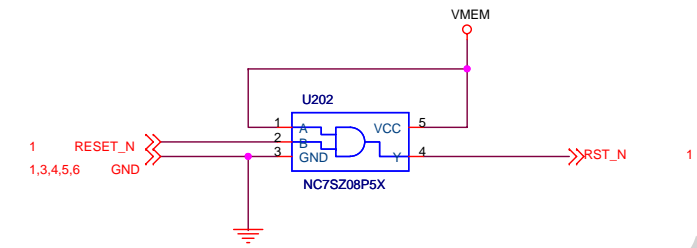
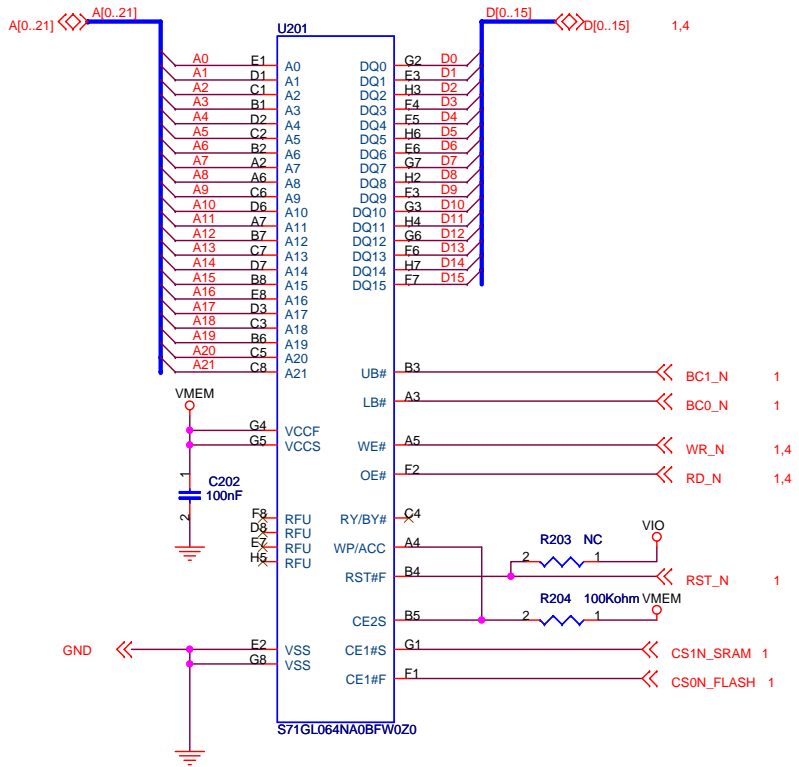
6. BLOCK DIAGRAM



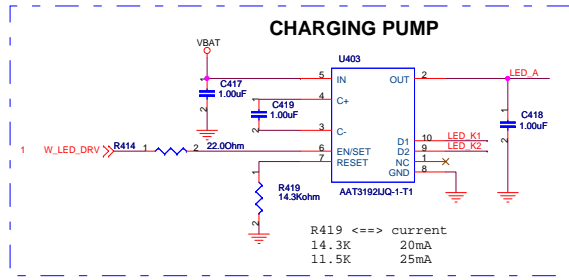
GB110 Platform Diagram

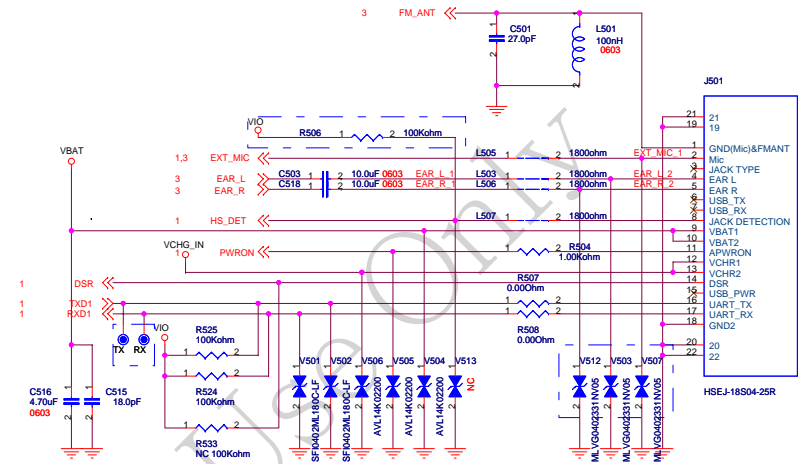
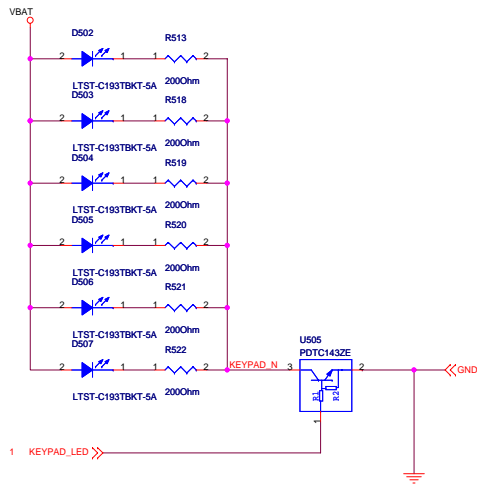
7. CIRCUIT DIAGRAM



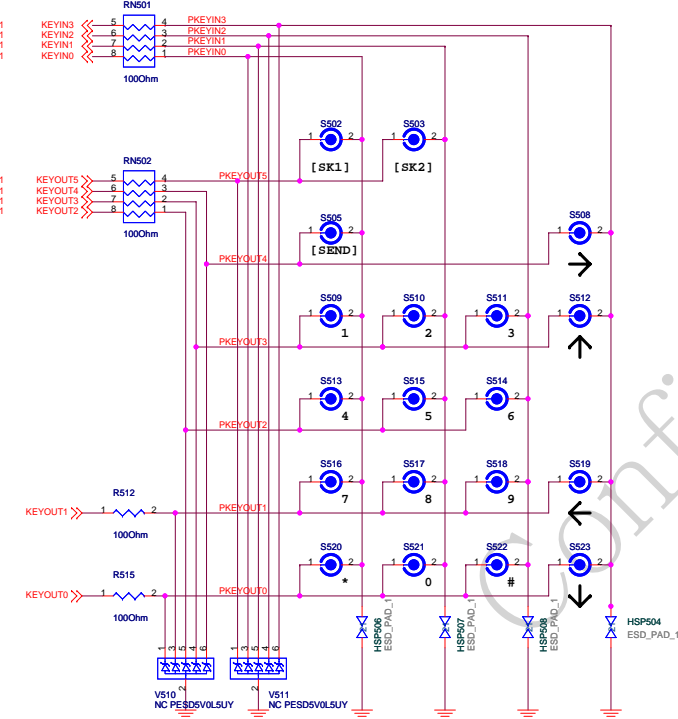


Title			
LG7			
Size B	Document Number	Rev	
Memory/SIM Card		V002	
Date:	Tuesday, December 09, 2008	Sheet	2 of 7

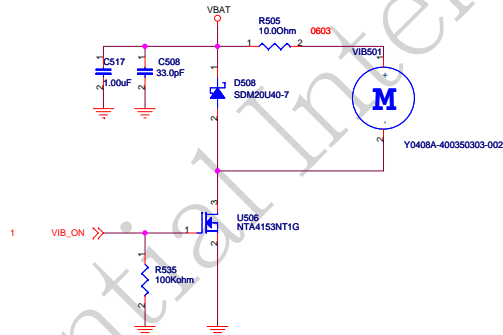




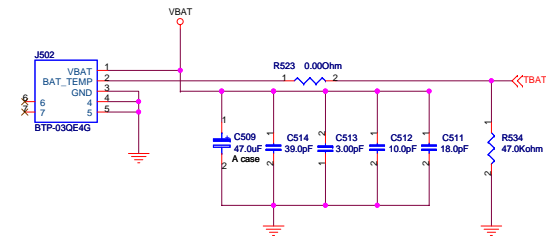
KEY PAD



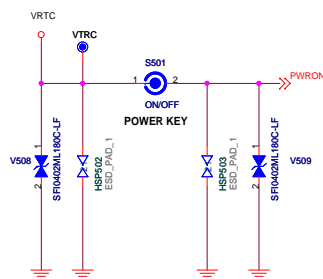
VIBRATOR



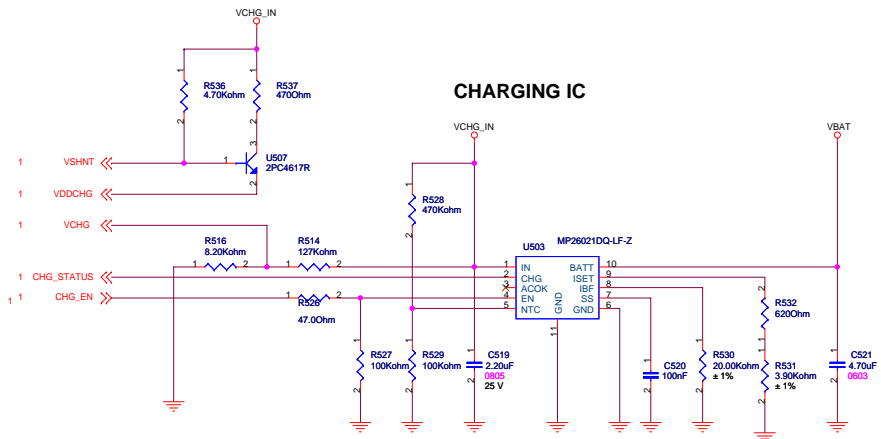
BATTERY CONNECTOR



POWER ON KEY



CHARGING IC



8. BGA IC PIN Check

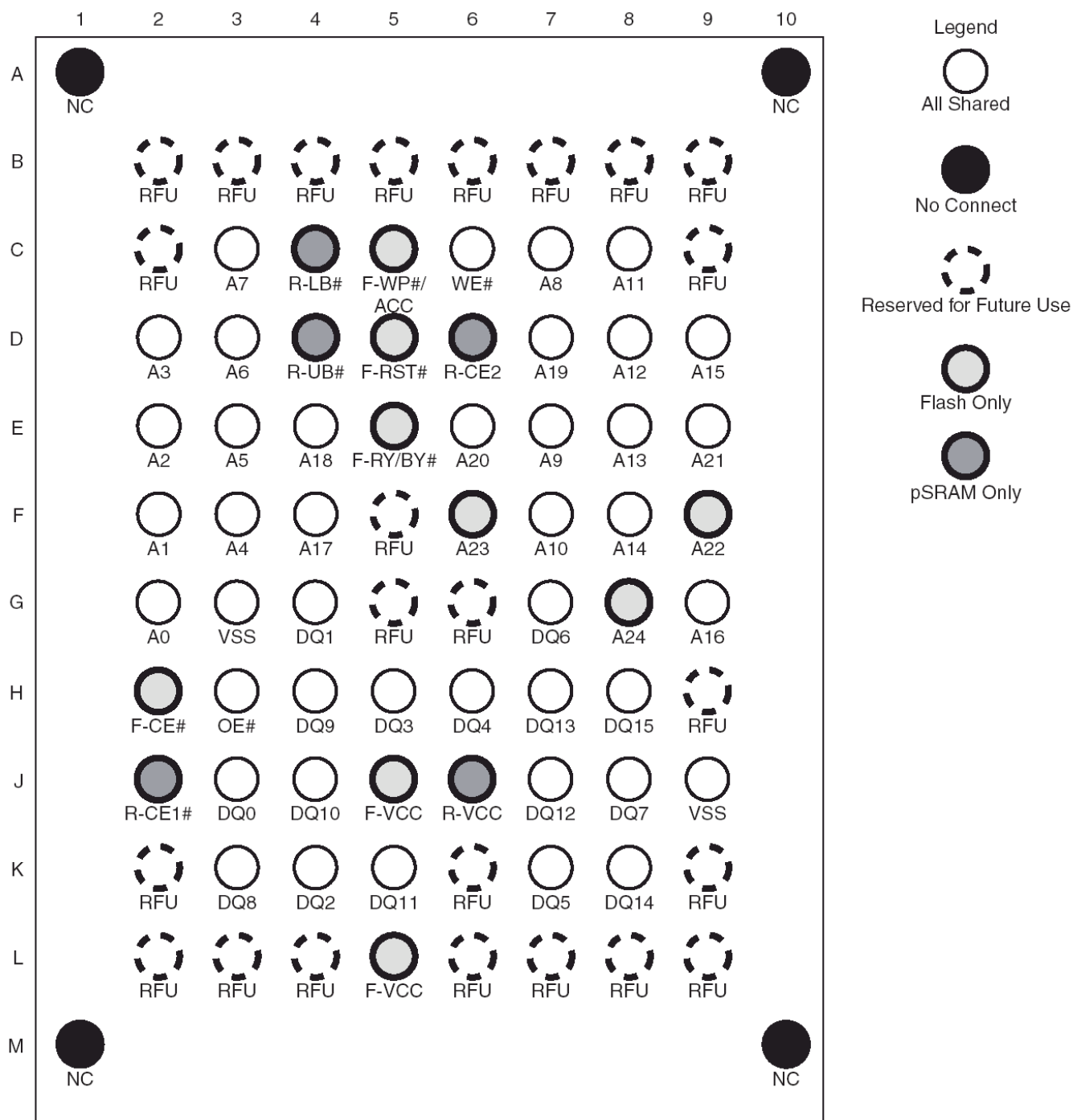
8.1 BGA PIN Check of MCU (PMB7890)

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	
15	VSS_RF1	RX12X	RX12	RX34X	RX34	VDD_LRF2V5	IREF	VBAT_3	AGND	VDD_LAN_A	LOUD1	VSS_MS1	MICN2	MICP1	VSS_MS6	15
14	TX1	VSS_RF3	VSS_RF7	VSS_RF10	VSS_RF13	VDD_VCO	W_LED_FB	VREFP	VDD_LBU_F	VSS_MS3	LOUC2	EPPA1	MICP2	MICN1	LINEIN	14
13	TX2	VSS_RF4			VSS_RF12	VDD_RX	VBAT_4	W_LED_BN	VDD_LME_M	VDD_LSI_M	EPN1			M0	M2	13
12	VSS_RF2	VSS_RF6		REXT	VSS_RF11	VBAT_2	VDD_LD1	M7	VDD_LRT_C	VSS_EPL_S	EPP1	VMIC		M1	VCHG	12
11	VDD_LO	VDD_LRF1V5	VDD_TRX	VSS_RP8								TDO	PAOUT1	TMS	VSS4	11
10	VDD_LRF_XO	VSS_RF6	VSS_RF8	VDD_DG		VSS8	VDD_PLL	CSB	SENSEP	VDD_LIO		TCK	TDI	SWTCH_ON	F32K	10
9	XOX	VSS2	KP6	KP4		FSYS	VDD_MAIN	SENSEN	CS	VDDCHG		MON1	TRST_n	RESET_n	OSC32K	9
8	XO	VSS1	KP0	KP7		KP5	COI3IO	TRIG_IN	VSHNT	VSS6		VSS9	TXD0	MON2	VDD_RTC	8
7	T_OUT0	T_OUT3	KP3	KP2		NMI_n	COI3IO	TRIG_OUT	VDDP_IO_EXTB	CLKOUT		TXD1	RXD0	MON4	CCRST	7
6	T_OUT3	T_OUT2	KP5	KP1		KP8	MON3	W_LED_DRV	VIB_CTRL	BACKLIGHT		ADV_n	RXD1	RDY_n	CCLK	6
5	T_OUT4	SSCI_MRS	SSCI_MTSR	AD16								CS3_n	A22	BFCLK0	CCD	5
4	COI0IO	SSCI_CLK		AD19	AD18	AD17	AD20	AD22	AD20	AD21	VDDP_MEM	AD16		CS0_n	AD0	4
3	RSTOUT_N	DISP_RESET			BCI_n	A17	FS3	AD29	AD28	CS1_n	A16			AD8	RD_n	3
2	SCL	SDA	BCI_n	AD21	WR_n	AD25	AD26	AD27	AD7	AD13	AD12	AD6	AD3	AD2	AD9	2
1	T2IN	WAIT_n	AD23	A18	A20	AD24	A21	A19	AD14	AD6	AD4	AD10	AD11	AD1	VSS6	1
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	

	analog functional balls				
	analog functional balls for earpiece				
	SIM card balls				
	RTC balls				
	DIG IO balls supplied via separate ball (VDDP_IO_EXTB)				
	DIG IO balls supplied internally via substrate (2.85V)				
	EBU balls				
	EBU power balls				
	VDD PLL balls also connected to LD1				
	VDD core balls(DSP, MAIN) connected to LD1				
	RF functional balls				
	RF power(VDD) balls				
	RF VSS balls				
	VSS balls(for digital)				

No NC pin

8.2 BGA PIN Check of Memory

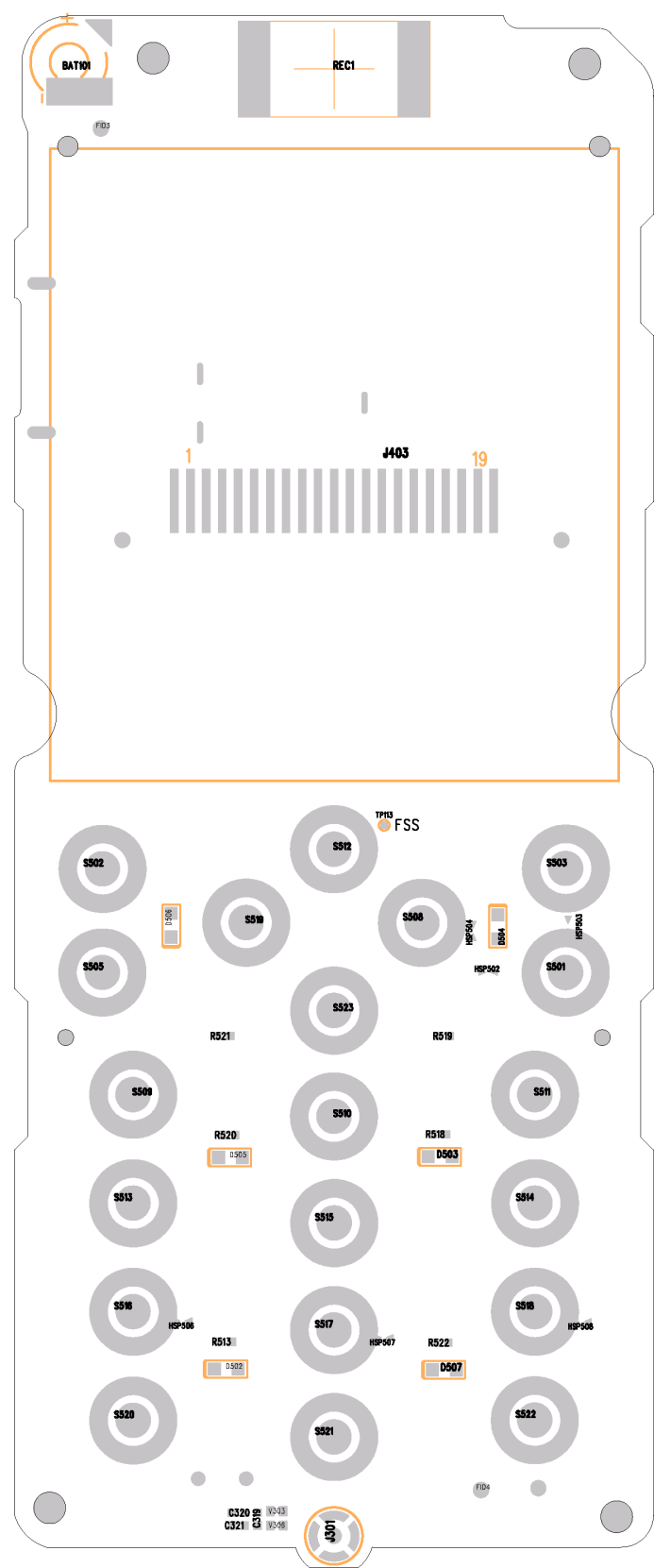


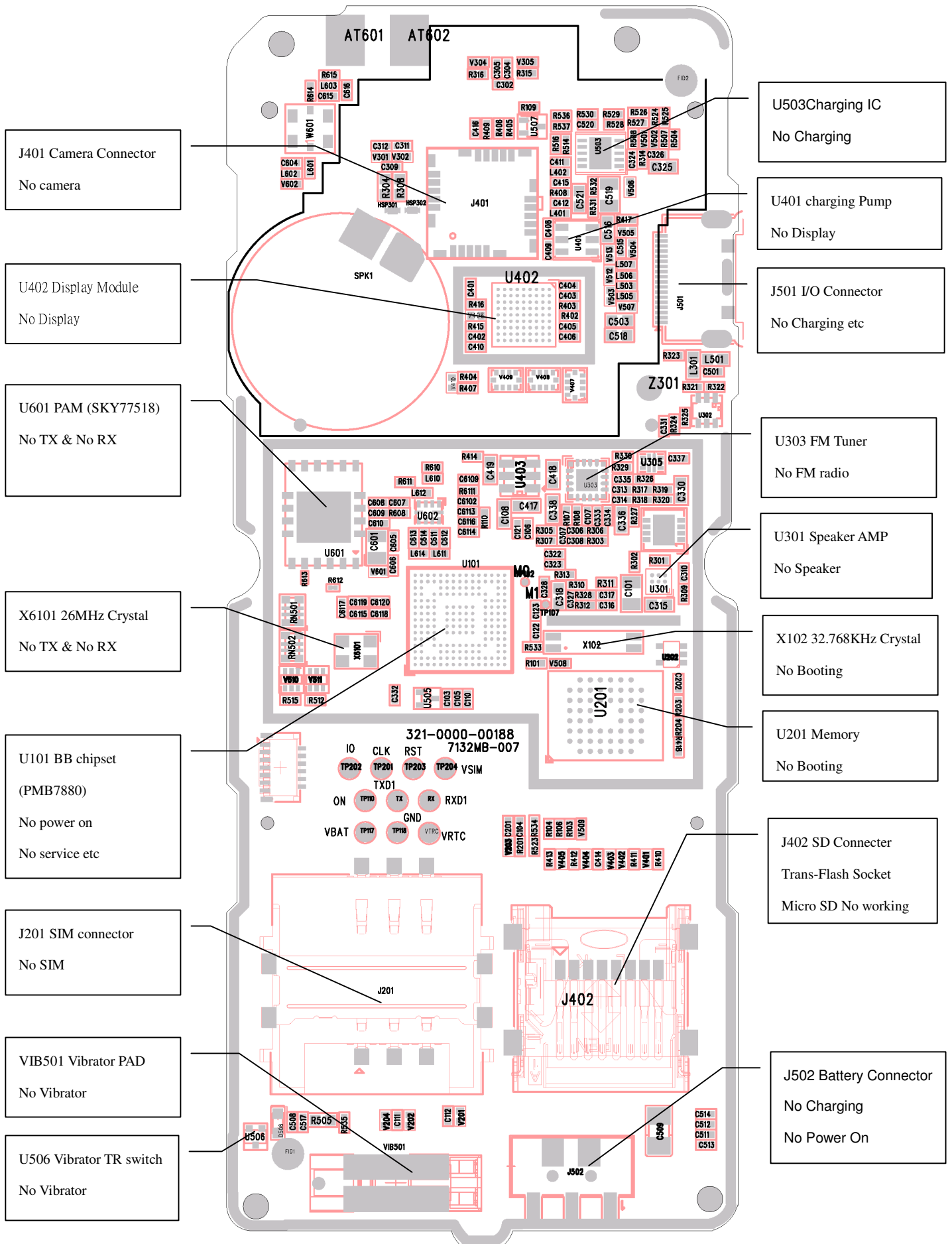
8.3 BGA PIN Check of Camera driver (AIT701A)

J1	J2	J3	J4	J5	J6	J7	J8	J9
PHSYNC	PMCLK	PHRD_	PHD2	PHD5	PHD6	VDD_CORE	PLCD3	VDD_IO1
H1	H2	H3	H4	H5	H6	H7	H8	H9
PS_RST_	PHCS_	PD0	PHWE_	PHD0	PHD4	PHINT	PHWAIT_	PHD8
G1	G2	G3	G4	G5	G6	G7	G8	G9
PVSYNC	PPXL_CLK	PD1	PRST_	PHD3	PHD7	PHD13	PHD15	PHD9
F1	F2	F3	F4	F5	F6	F7	F8	F9
PSDA	PDCLK	PSCK	PHD1	PHLCD_BY	PHLCD2_CS_	PHD12	PHD14	PHD10
E1	E2	E3	E4	E5	E6	E7	E8	E9
VDD_IO0	PSEN	GND_IO0	GND_CORE	GND_IO1	PHLCD_A0	PLCD8	PTEST_EN	PHD11
D1	D2	D3	D4	D5	D6	D7	D8	D9
PD2	PD4	VDD_IO2	VDD_PLL	PLCD11	PLCD10	PLCD7	GND_IO2	PGPIO0
C1	C2	C3	C4	C5	C6	C7	C8	C9
PD5	PSCAN_EN	PLCD_A0	PGPIO6	PLCD12	PLCD9	PLCD6	PLCD4	PGPIO1
B1	B2	B3	B4	B5	B6	B7	B8	B9
PD7	PD3	PLCD1_CS_	PLCD14	PLCD13	PGPIO5	PLCD5	PLCD1	PGPIO2
A1	A2	A3	A4	A5	A6	A7	A8	A9
PD6	PLCD2_CS_	PLCD_RD_	PLCD_WE_	PLCD15	PGPIO4	PLCD2	PLCD0	PGPIO3

No NC pin

9. PCB LAYOUT





10.Engineering Mode

1 Function Test

1.1 Test Purpose

To verify handset functional is pass or fail when assembled by visual check.


1.2 Test Facilities List

- 1.Battery
- 2.Earphone
- 3.Charger
- 4.GSM tester (4201S)
- 5.Battery Cover
- 6.FM transmitter
- 7.Micro SD card 4GB

1.3 Test Procedure

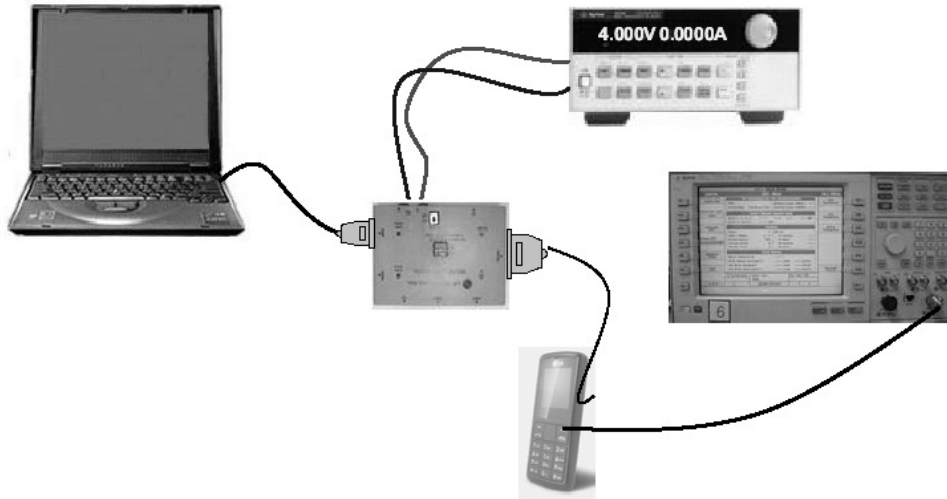
1.3.1 Auto test sequence

1. Operator not need to insert test SIM card, and enter “*8*” to check “auto test” as below.
2. When operator into function test mode, we just press “yes” key or “enter” key to into next test item.
3. When use auto test, every test item always turn on together.

No.	Test item	Verifying item
1	LCD	Display check (All white, all black, red, blue, green test) Every screen is 0.5 second 
2	LCD & LED /Illumination	LCD Backlight
		All Keypad LED
3	Vibrator	Vibrator function check (Always on)
4	Keyboard + Speaker	All keys function check Method 1: screen shows all icons for key and operator press key one by one then it disappear in screen. Method 2: screen shows icon of key one by one then operator press it as phone instruction.
		Speaker check
5	Audio (Mic_ Receiver loop)	Main Mic to Main Receiver audio loop check
6	Headsets (Earpiece)	Aux-Mic to Aux Receiver audio loop check
7	Melody	Speaker and Melody function check (Always on/Set max volume)
8	FM	Default handset in FM channel 100.7 MHz 1. Testing FM through headset (earpiece) 2. Testing FM through Battery cover (external Antenna) Testing FM through SPK
9	Camera	Preview Capture
10	Micro SD card	Write / read / Del
11	Charging	Charging function check
12	Antenna	Antenna circuit check by Radiation Power (Turn on GSM Power level 5 @ Ch40 for 900/1800 band Turn on GSM Power level 5 @ Ch190 for 850/1900 band)

11.Calibration

11.1 Test equipment setup



11.2 APT Technologies (calibration tool)

11.2.1 Installation

Before install this program, it must install GPIB, VISA drivers and .Net Framework 2.0 at first.
Press the next to continue the installation.



Fig.12 APT Technologies installation

Choose the wireless communication test set type. Select Agilent 8960 and press next to continue installation. Only Agilent 8960 is the only available for selection at present, CMU200 has no function.

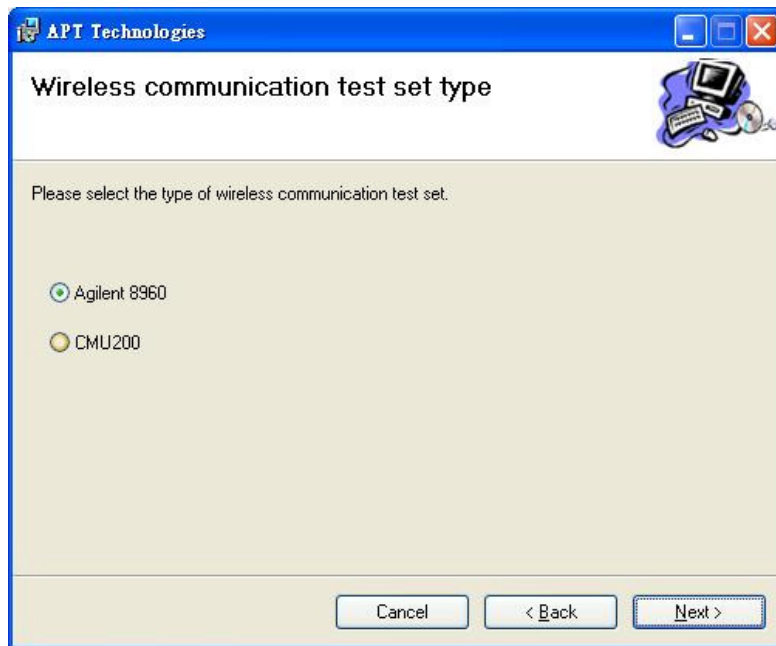


Fig.13 Choose the wireless communication test set type

Choose the installing catalogue; if it is necessary you can change the folder to install. Press next to continue the installation.

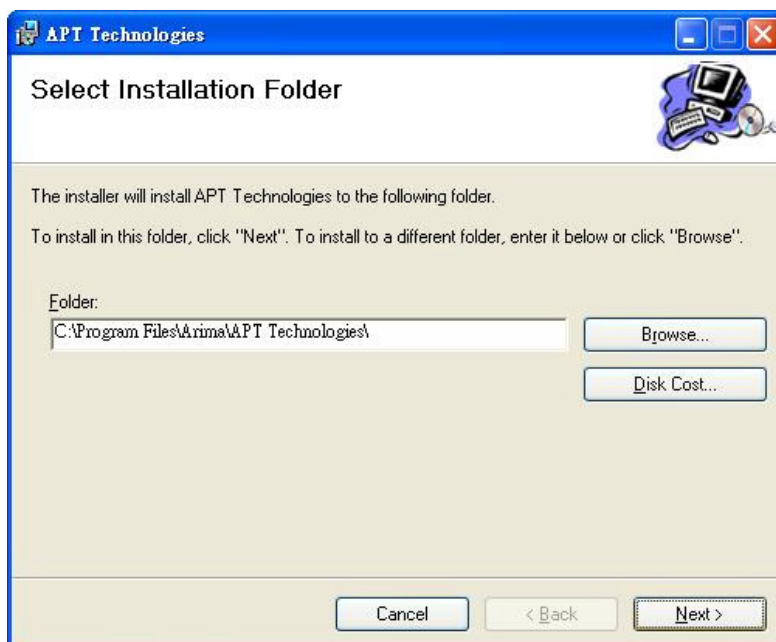


Fig.14 Choose the catalogue to install

Choose the wireless communication test set type. Select Agilent 8960 and press next to continue installation. Only Agilent 8960 is the only available for selection at present, CMU200 has no function.

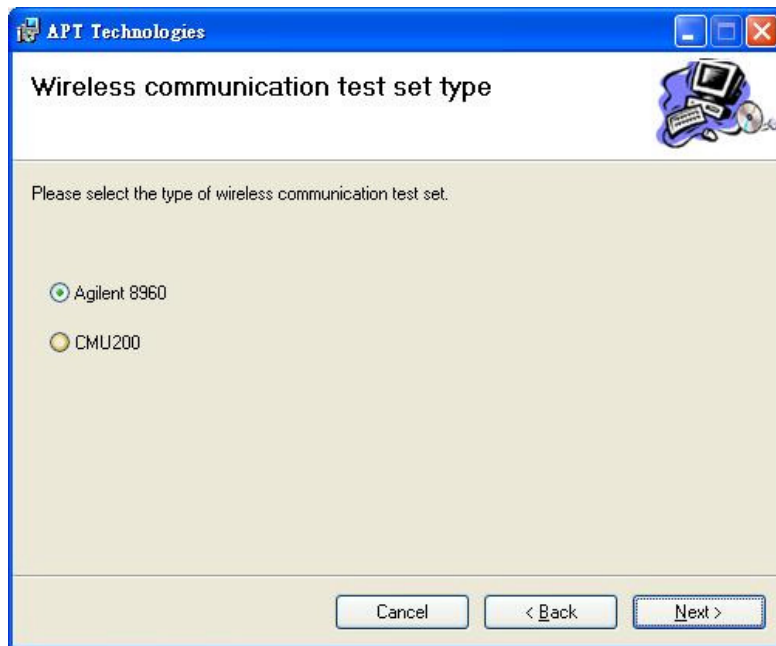


Fig.15 Choose the wireless communication test set type

Choose the installing catalogue; if it is necessary you can change the folder to install. Press next to continue the installation.

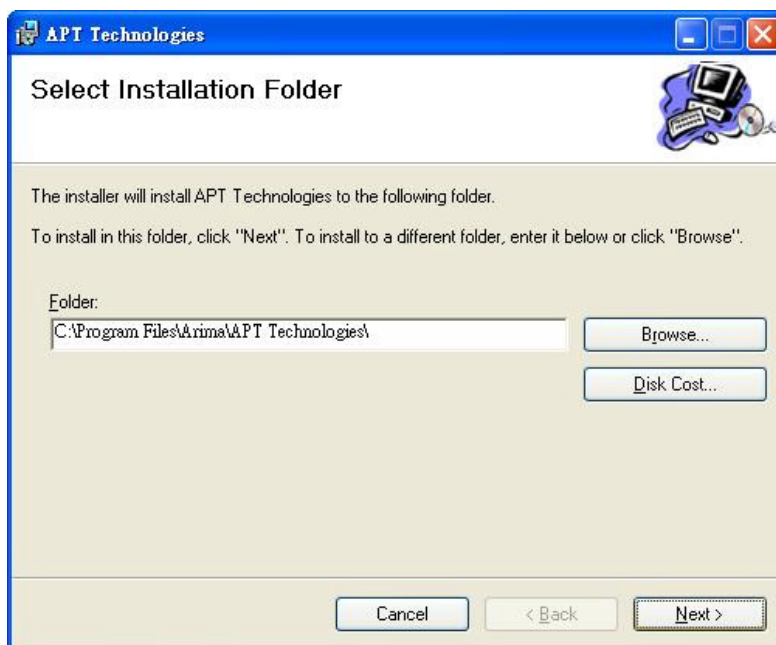


Fig.16 Choose the catalogue to install

Confirm installation and press next to install the program, if need to change setting press back to set up.

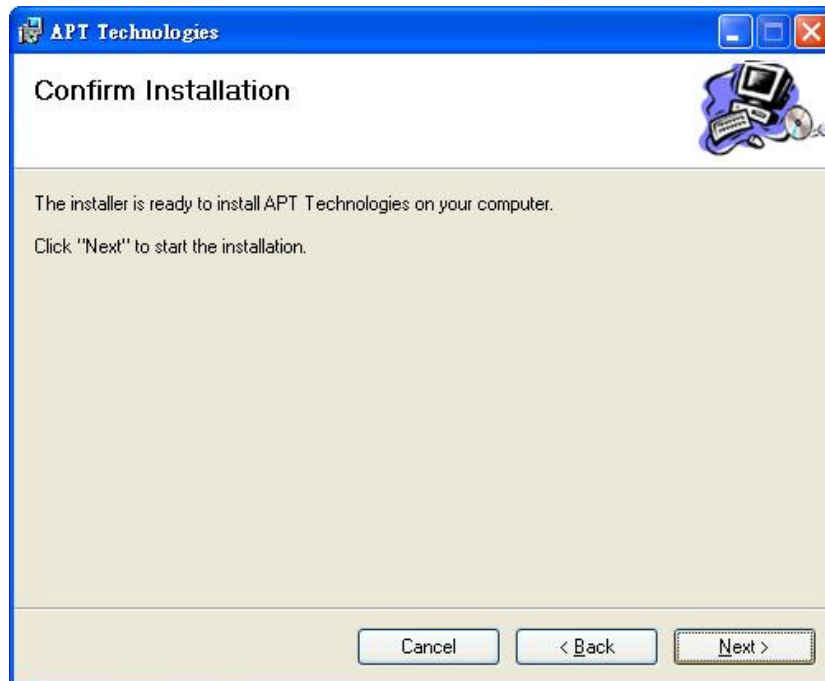


Fig.17 Confirm installing

While installing it will appear a window like Fig.18, it will begin to install the test scripts after choosing installation, if change the catalogue of installing before, this installation catalogue must keep the same with APT.



Fig.18 Installation Test Script

Installation finishes finally, pushing and closing the button finishes installing.

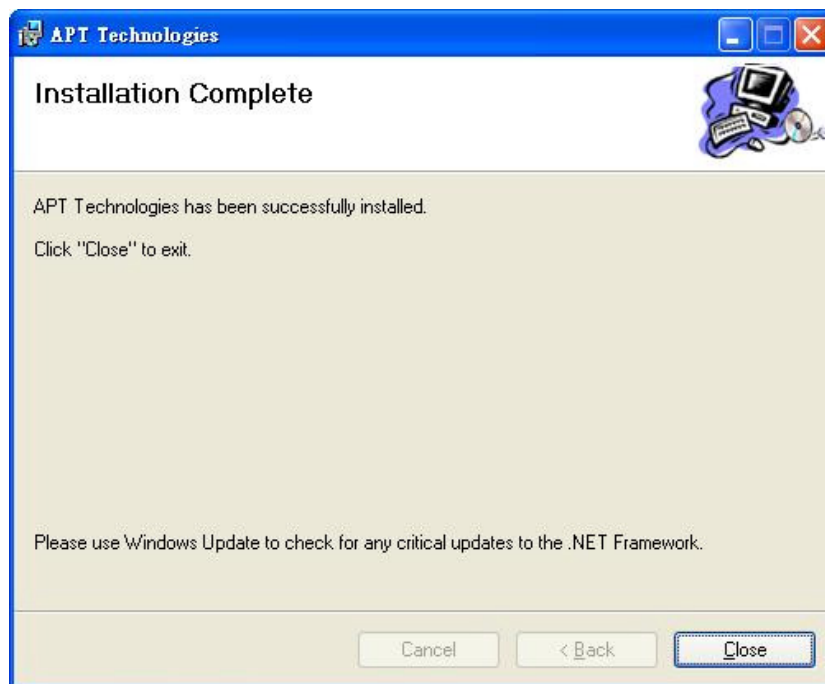


Fig.19 It finishes to install

It will present two shortcuts in the tabletop after finishing the installation:



ATP Tools Icon.



Auto Cable Loss Compensation Tools Icon.

11.2.2 User's interface

After opening the APT Program, it will appear a window like Fig.20, several proves as follows:

Station: BOARD_TRIM_1 Version : 1.8.7.0 APTDLL Version : 1.3.9.1

Script file: _____

☒ FT ☒ CAL

COM: 4

APT Version: 1.8.7.0
DLL Version: 1.3.9.1
Script Version: 1.5
8960 Version: _____

Serial Number: _____

Real Time: 2008/12/25 10:59:26

Test Time: 0 sec.

Item	S...	Description	P/F	MV	Unit	Output Line	LL	UL	Test Time
------	------	-------------	-----	----	------	-------------	----	----	-----------

Start **Quit**

Pass: 0 Total: 0 Result: Pass Error: No Error!

Total, Fail, Pass Rate: % Average Test Time: sec 2008/12/25 上午 10:59:26

Fig.20 User's interface

1. Title: Read the station and version from equipment_config.txt, for example: Station: BOARD_TRIM_1 Version: APT V1.8.7
2. Script file: File of test script; show the testing script file location and file name.
3. FT: It will select the script for Final Test.
4. Cal: It will select the script for Calibration.
5. COM: Show the communication port connected with mobile phone at present.
6. List: The large window on the right shows the tests list at present.
7. Progress Bar: Show that the test progress at present.
8. Serial Number: Same as Bar Code.
9. Real Time: Show the time of the computer.

10. Test Time: Show the time when it has been already finished the test.
11. Arima: Company Mark, if double click this mark and input the password , will appear a window it can set the equipment_config.txt for RD.
12. Start: Begin to run the test; it will appear a window that can input Bar Code. After input the Bar Code, it will begin to run the test.
13. Quit: Close the APT program.
14. Pass: Count the quantity of Pass at present, if reopens the program it will calculate again.
15. Total: Count and quantity of test at present, if reopens the program it will calculate again.
16. Result: Show the test result at present.
17. Error: It will show the fist fail message.
18. The state bar:
 1. Total: Count the quantity of test at present.
 2. Fail: Count Fail quantity at present.
 3. Pass Rate %: Count the probability of Pass at present.
 4. Average Test Time: Count and test time equally at present.
 5. Time at present.

11.2.3 Test the program

Begin to test

After opening the program, confirms that it is errorless to set up, some lower Start will appear the Bar Code input window, such as Fig.21, begin to test like Fig.22 after scanning or inputting Bar Code.

The screenshot displays the Arima test program interface. At the top, a status bar shows 'Product Model : GB105a_7121;GB100a_7115;GB107a_7123;GB101a_7117', 'Station : BOARD_TRIM_1', and 'Version : 1.8.7.0'. The main window has a light blue background. On the left, there are checkboxes for 'FT' and 'CAL', a 'COM' port dropdown set to '4', and version information: 'APT Version 1.8.7.0', 'DLL Version 1.3.9.1', 'Script Version 1.5', and '8960 Version'. Below this is a 'Serial Number' field and a 'Real Time' clock showing '2008/12/25 13:59:58'. A 'Test Time' field shows '0 sec.'. In the center, a modal dialog box titled 'Bar Code' with a blue header and border is open, containing the text 'Please Input Bar Code' and an empty input field. At the bottom left is a large 'Start' button. To its right are 'Pass' and 'Total' counters, both showing '0', and a 'Quit' button. Further right are 'Result' and 'Error' fields, showing 'Finish Loading.' and 'No Error!' respectively. The bottom status bar displays 'Total: 0, Fail: 0, PR: 100%', 'Avg TestTime: 0sec', and the date/time '2008/12/25 下午 01:59:58'.

Item	S...	Description	P/F	MV	Unit	Output Line	LL	UL	Test Time
------	------	-------------	-----	----	------	-------------	----	----	-----------

Fig.21 Input Bar Code window

While testing

Will accord with and test the test item by item of the script while testing, every test result will show on List.

Product Model : GB105a_7121;GB100a_7115;GB107a_7123 Station : BOARD_TRIM_1 Version : APT V1.4.7

Script file C:\Program Files\Arima\APT Technologies\Test Script01_LG6_US_Band\Test_Script_SysT_8960.txt

☒ FT ☐ CAL

COM 4

Item	S...	Description	P/F	MV	Unit	Output Line	LL	UL	Test Time
3125	6	Switch_Spectrum_12...	P	-59.65	dBc		-100	-30	
3125	7	Mod_Spectrum_200...	P	-34.78	dBc		-100	-30	
3125	8	Mod_Spectrum_200...	P	-35.31	dBc		-100	-30	
3125	9	Mod_Spectrum_400...	P	-69.67	dBc		-100	-60	
3125	10	Mod_Spectrum_400...	P	-71.09	dBc		-100	-58	
3125	11	Mod_Spectrum_120...	P	-80.56	dBc		-100	-60	
3125	12	Mod_Spectrum_120...	P	-81.61	dBc		-100	-60	
3131	1	SetTxLevel (RCALX...	P	1	-		1	1	0.077
3132	1	Meas_TxPower (RC...	P	4.5	-	Band=GSM850;Cha...	3	7	0.311
3133	1	Phase_Error_RMS (...)	P	0.45	-	Band=GSM850;Cha...	-5	5	0.109
3133	2	Phase_Error_Peak (...)	P	1.15	-		-20	20	
3133	3	Freq_Error_in_Hz (...)	P	0.85	-		-88.02	88.02	
3134	1	Power_vs_time_mas...	P	1	-	Band=GSM850;Cha...	1	1	0.202
3135	1	Switch_Spectrum_40...	P	-52.15	dBc	Band=GSM850;Cha...	-100	-23	0.202
3135	2	Switch_Spectrum_40...	P	-48.21	dBc		-100	-23	
3135	3	Switch_Spectrum_60...	P	-59.43	dBc		-100	-26	
3135	4	Switch_Spectrum_60...	P	-53.86	dBc		-100	-26	
3135	5	Switch_Spectrum_12...	P	-62.06	dBc		-100	-32	
3135	6	Switch_Spectrum_12...	P	-63.74	dBc		-100	-32	
3135	7	Mod_Spectrum_200...	P	-35.59	dBc		-100	-30	
3135	8	Mod_Spectrum_200...	P	-36.12	dBc		-100	-30	
3135	9	Mod_Spectrum_400...	P	-67.22	dBc		-100	-50	
3135	10	Mod_Spectrum_400...	P	-67.15	dBc		-100	-48	
3135	11	Mod_Spectrum_120...	P	-70.49	dBc		-100	-50	
3135	12	Mod_Spectrum_120...	P	-71.19	dBc		-100	-50	
3151	1	Meas_RxLev (RCA...	P	10	-	Band=GSM850;Cha...	8	12	1.793
3151	2	Meas_BER (RCALX...	P	0	-		0	3	

Serial Number DZGWSZEH

Real Time 2008/7/31 10:34:57

Test Time 102.561sec.

Arima COMMUNICATIONS

Runnin

Pass 1

Total 1

Result

Error

Total:1, Fail:0, PR:100%

Avg TestTime: 102.6sec

2008/7/31 上午 10:34:57

Fig.22 Sketch map while testing

1. Item: Mainly test the procedure serial number.
2. Sub: Test the procedure serial number less importantly.
3. Description: It is tested that the procedure proves.
4. P/F: P means test succeeds, F means test failure.
5. MV: Number value received in test.
6. Unit: Unit.
7. Output Line: Word bunch got in test.
8. LL: The lower limits.
9. UL: The upper limits.
10. Test Time: This tests the execution time of procedure.

Test fails

If there is fail, the picture will show red, and will show the result in Result, if there is Error Message will show on Error. Window with Bar Code input will jump out for continue test the next mobile.

If input QUIT it can close the input Bar Code window, and can make, fix or change and test the script.

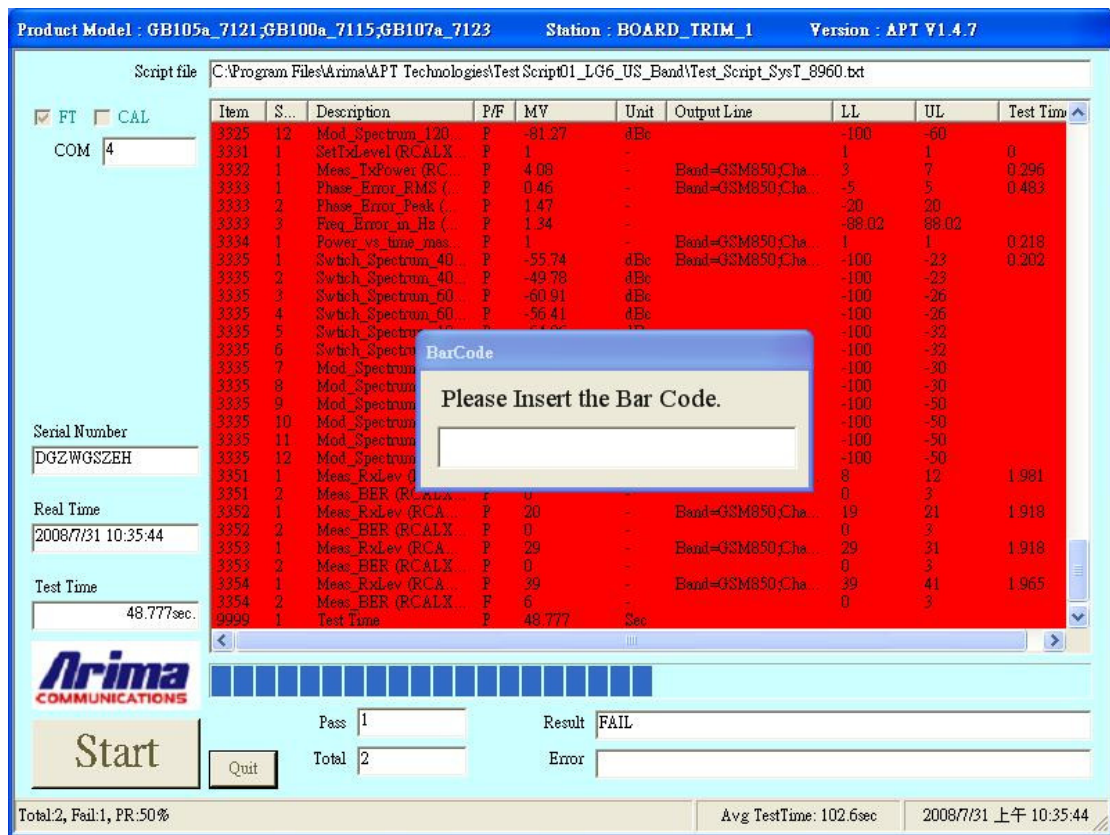


Fig.23 Sketch map that test fails

Test succeeds

Test Pass will getting green, and jump out the input Bar Code window for next test.

If input QUIT it can close the input Bar Code window, and can make, fix or change and test the script.

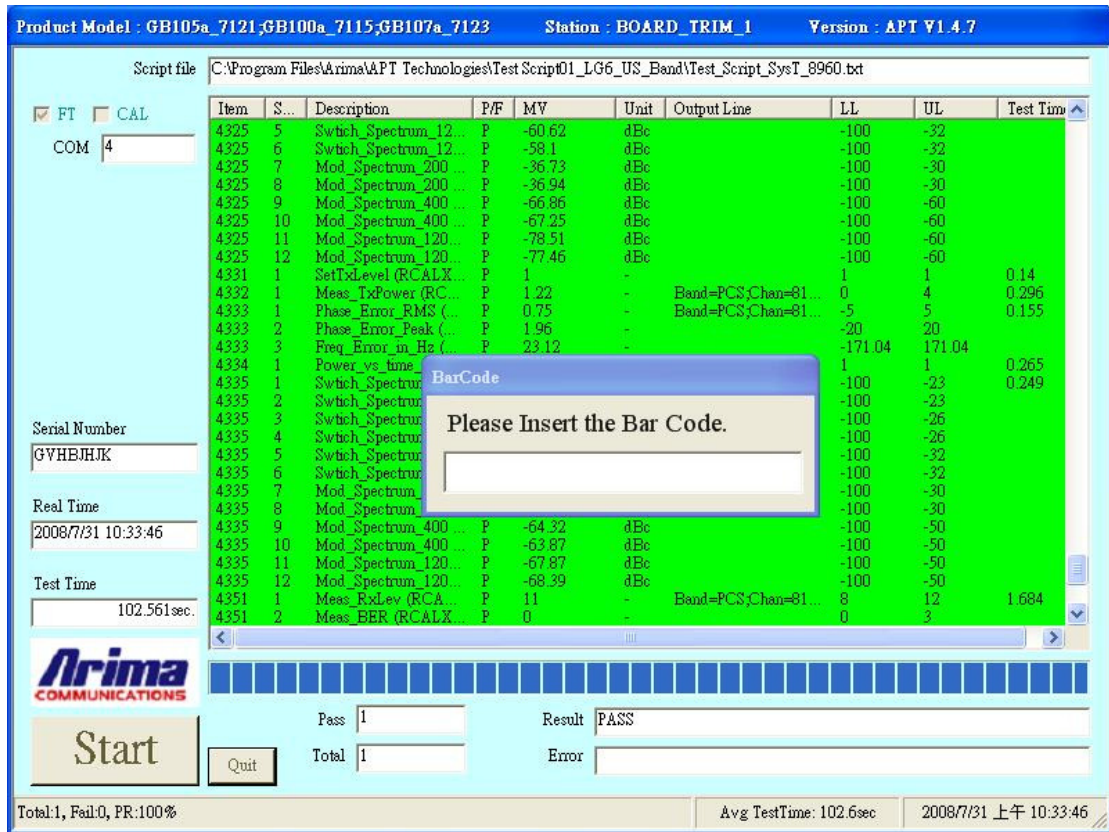


Fig.24 Test succeeds in finishing the sketch map

11.2.4 Set up

Double click the Arima icon will show set up window.

Station: BOARD_TRIM_1 Version : 1.8.7.0 APTDLL Version : 1.3.9.1

Script file

☒ FT ☒ CAL

COM 4

APT Version 1.8.7.0

DLL Version 1.3.9.1

Script Version 1.5

8960 Version

Serial Number

Real Time 2008/12/25 10:59:26

Test Time 0 sec.

Arima
COMMUNICATIONS

Start Quit

Pass 0 Result Pass

Total 0 Error No Error!

Total, Fail, Pass Rate: % Average Test Time: sec 2008/12/25 上午 10:59:26

Fig.25 Double click “ARIMA” icon window

The window for setting up Equipment_config.txt file. The item shows as follows.

Config

Equipment Config

Tester

Tester Address: 14

Tester Type: 0

Default Test Select: Cal & FT

Power Supply

Power Supply Type: 0

Power Supply Address: 5

COM Port

ComPort: COM4

BaudRate: 115200

DTR: 0

RTS: 1

Platform:

Prefix:

Test Report

Test Result Drive: C:

Test Result Dir: Self

Type: Test Script09_LG7_EU_Band_V1.4

DUMMY IMEI

DUMMY IMEI: 12345678901234

☒ Debug

SFC

SFC: No SFC

TMO Request Drive: X:

TMO Response Drive: Y:

TMO Result Drive: Z:

TMO Request Dir: BOARD_TRIM_RE

TMO Response Dir: BOARD_TRIM_RE

TMO Result Dir: BOARD_TRIM_RE

Model Request Drive: U:

Model Response Drive: V:

Model Request Dir: CHECK_MODEL_F

Model Response Dir: CHECK_MODEL_F

Test Script Drive: T:

Test Script Dir: MMI

Test Script SubDir: LG67

Shielding Box

Shielding Box Address: 3

Shielding Box Type: 0

Client Info

Station: BOARD_TRIM_1

LineNo: S4

Employee: 970164

Host Name: 127.1.1.1

User Name: s

Pass Word: w

Log Host Name: 127.1.1.1

Log User Name: s

Log Pass Word: r

TSHost Name: 127.1.1.1

TSUser Name: s

TSPass Word: r

Save **Exit**

Fig.26 The window for setting up

1. Tester

Test Address: Wireless Communication test set GPIB address.

Tester Type: Type of the comprehensive tester. (0: 8960, 1: CMU200.)

Default Test Select: Choose default test item.

2. Power Supply

Power Supply Type: Type of power supply. (0: 663xx.)

Power Supply Address: Power supply GPIB address.

3. COM Port

Com Port: The communication port with mobile phone.

Baud Rate: Baud Rate with the mobile phone communication. (115200)

DTR: DTR with the mobile phone communication. (0)

RST: RST with the mobile phone communication. (1)

Platform: ulc2 or ulc2+. (xmm1020)

Prefix: Mobile phone Config. File does not include the other name of edition. (xmm1020)

4. Test Report

Test Result Drive: Set up disk drive names that result file.

Test Result Dir: Set up the materials of the disk drive of the network to insert the name.

If set up and does not use the disk drive of the network for Self.

Type: Choose to carry out the type to test script at present.

5. DUMMY IMEI (No Function)

DUMMY IMEI: Establishment should store the number of IMEI Label.

6. Debug

If selected it will continuous the test however test item is fail.

After set up and finish the above six item, push “save” button, will appear a window, click yes to store and initialize. Click Exit to close config setting window.

The screenshot shows a 'Config' window with a blue title bar and a green background. It is divided into several sections:

- Equipment Config (Left):**
 - Tester:** Tester Address (14), Tester Type (0), Default Test Select (Cal & FT).
 - Power Supply:** Power Supply Type (0), Power Supply Address (5).
 - COM Port:** ComPort (COM4), BaudRate (115200), DTR (0), RTS (1), Platform, Prefix.
 - Test Report:** Test Result Drive (C:), Test Result Dir (Self), Type (Test Script09 LG7 EU Band V1.4).
 - DUMMY IMEI:** DUMMY IMEI (12345678901234), ☐ Debug.
- Equipment Config (Middle):**
 - SFC:** SFC (No SFC), TMO Request Drive (X:), TMO Response Drive (Y:), TMO Result Drive (Z:), TMO Request Dir (BOARD_TRIM_RE), TMO Response Dir (BOARD_TRIM_RE), TMO Result Dir (BOARD_TRIM_RE), Model Request Drive (U:), Model Response Drive (V:), Model Request Dir (CHECK_MODEL_I), Model Response Dir (CHECK_MODEL_I), Test Script Drive (T:), Test Script Dir (MMI), Test Script SubDir (LG67).
 - Shielding Box:** Shielding Box Address (3), Shielding Box Type (0).
- Equipment Config (Right):**
 - Equipment Config:** A text area showing configuration commands: //Tester Type = 0.8960, Tester Type = 0, 8960 GPIB Address=GPIB0::14::INSTR, /O : Cal, 1 : Final, 2 : Cal & Final, DEFAULT_TEST_SELECT = 2, //Power Supply, /O : 663xx, Power Supply Type = 0, Power Supply Address=GPIB0::5::INSTR.
 - [COM PORT SETTING]:** ComPort = COM4.
 - Client Info:** Station (BOARD_TRIM_1), LineNo (S4), Employee (970164), Host Name (127.1.1.1), User Name (s), Pass Word (w), Log Host Name (127.1.1.1), Log User Name (s), Log Pass Word (r), TSHost Name (127.1.1.1), TSUser Name (s), TSPass Word (r).

At the bottom, there are 'Save' and 'Exit' buttons.

Fig.27 Store and revise the window

11.2.5 Auto Cable Loss Compensation (ACL)

ACL another procedure, install, can by the way installation together, and establishment that use file corresponding to APT, this procedure must correct with Golden, the procedure will calculate Loss that should be mended and write into Cable automatically For APT procedure to use in Loss.txt file. The picture is as follows after opening.

Item	S...	Description	P/F	MV	Unit	Output Line	LL	UL	Test Ti...
------	------	-------------	-----	----	------	-------------	----	----	------------

Fig.28 Auto Cable Loss Compensation

This procedure and APT are very much the same, more different place among them, must choose the type of Golden first on the left, and input and test the number of times (Times) the most largely, The procedure will judge automatically if each loss value is less than 0.1 to finish automatically, if exceed testing the figure does not have all loss value to less than 0.1 meetings Fail the most largely.

Succeed Pass can write new Cable Loss value into Cable_Loss.txt file.

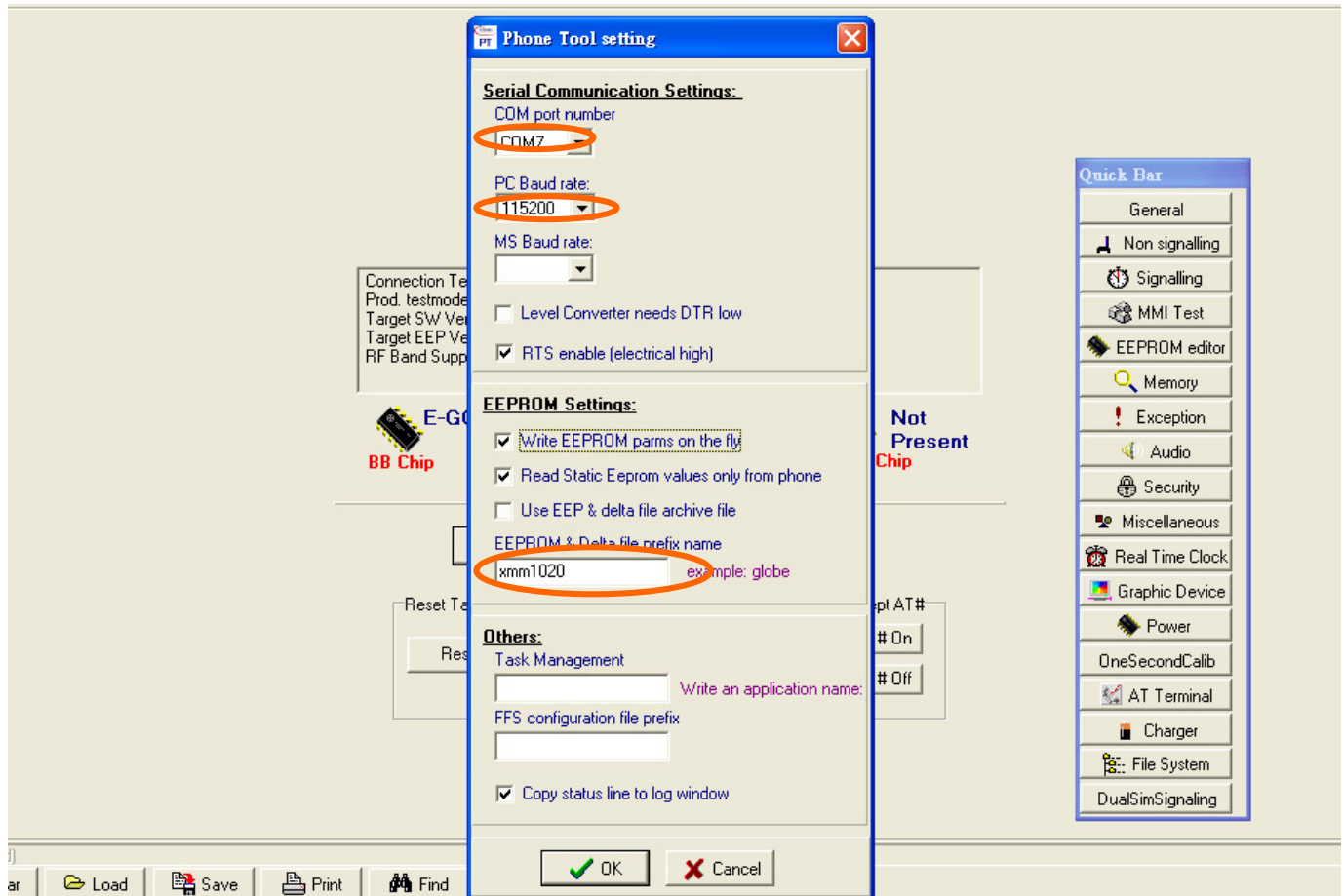
12. Stand alone test

12.1 Test program setting

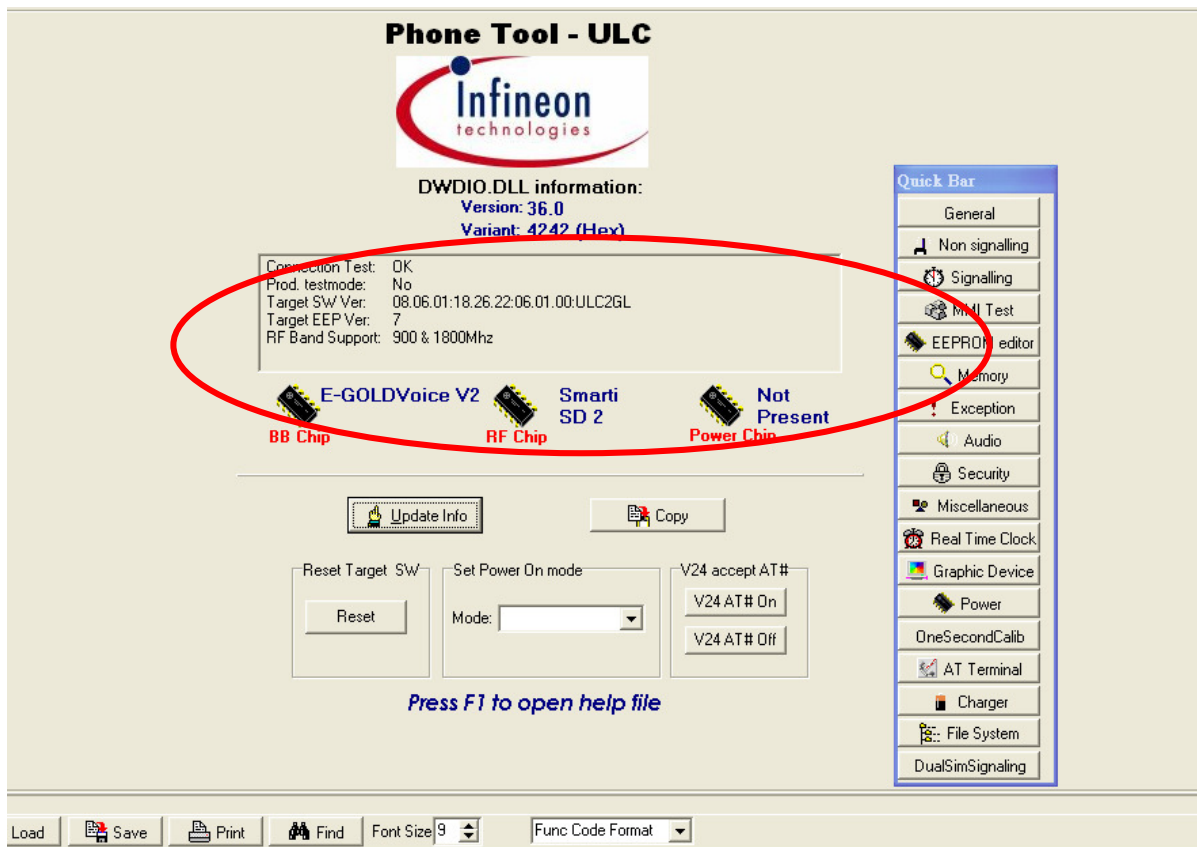
12.1.1 Set COM port

12.1.2 Check PC Baud rate (115200)

12.1.3 Confirm EEPROM & Delta file prefix name

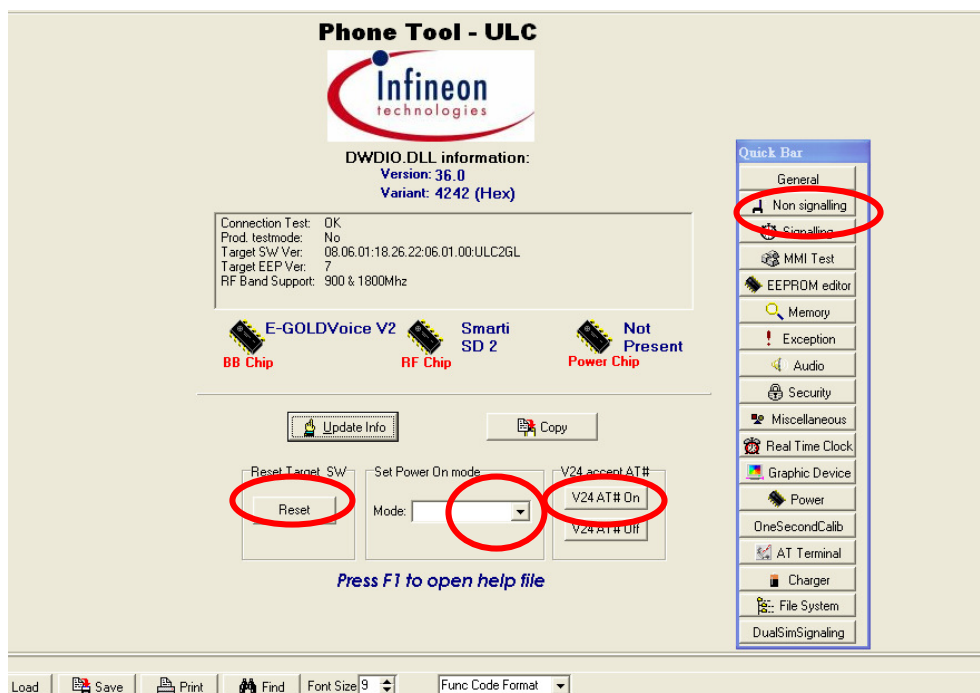


12.1.4 Press power on key, then click “V24AT#ON” and then “ Update Info” for communicating Phone and Test Program



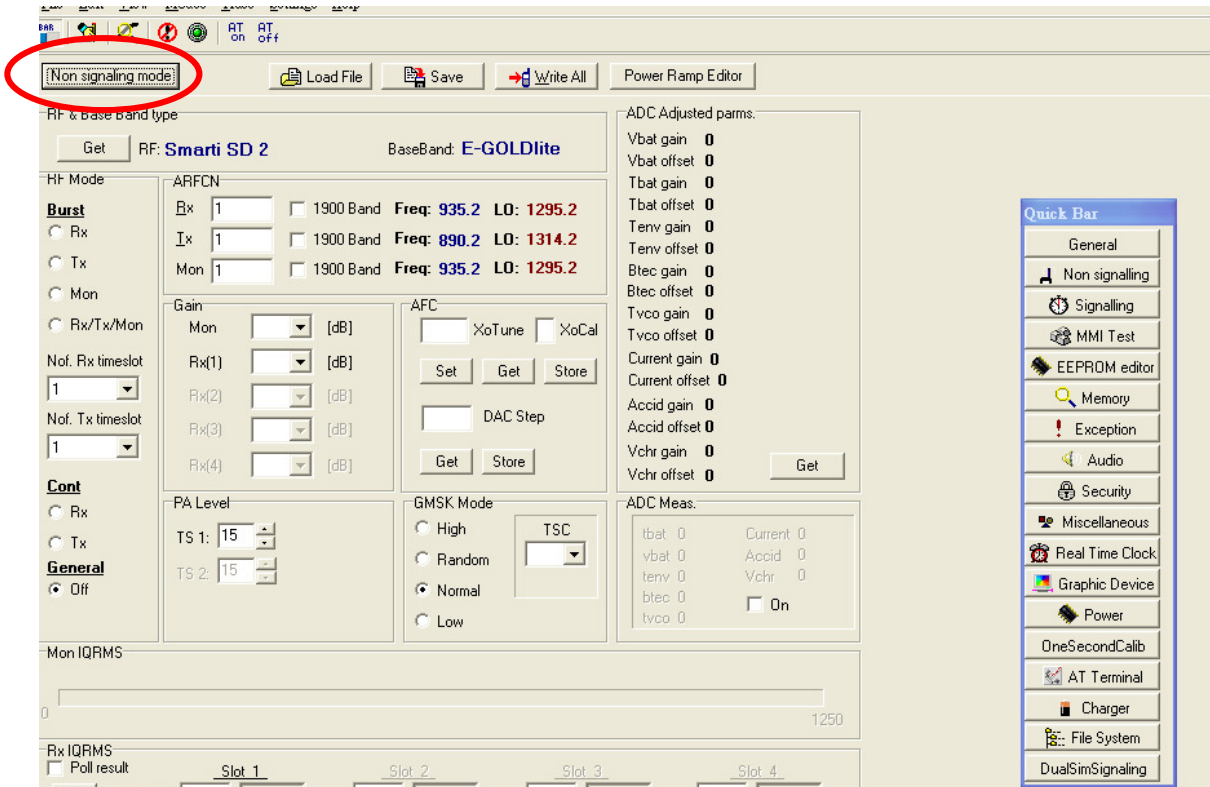
12.1.5 For the purpose of the Stand alone Test ,Change the phone to” ptest mode” and then click the “ Reset” bar

12.1.6 Select “Non signaling” in the Quick Bar menu. Then Stand alone Test set up finished.



12.2 TX Test

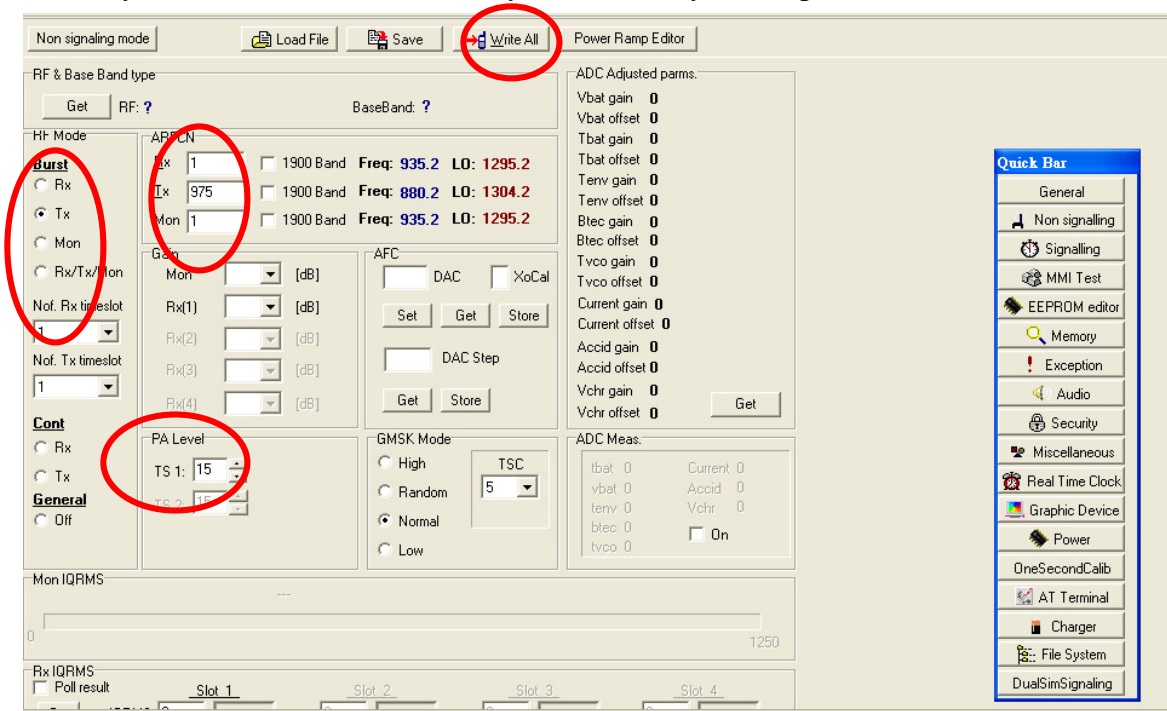
12.2.1 Click “Non signaling mode” bar and then confirm “OK” test in the command line.



12.2.2 Put the number of TX channel in the ARFCN.

12.2.3 Select “TX” in the RF mode menu and “PCL” in PA level menu .

12.2.4 Finally, Click “Write All” bar and try the efficiency test of phone.

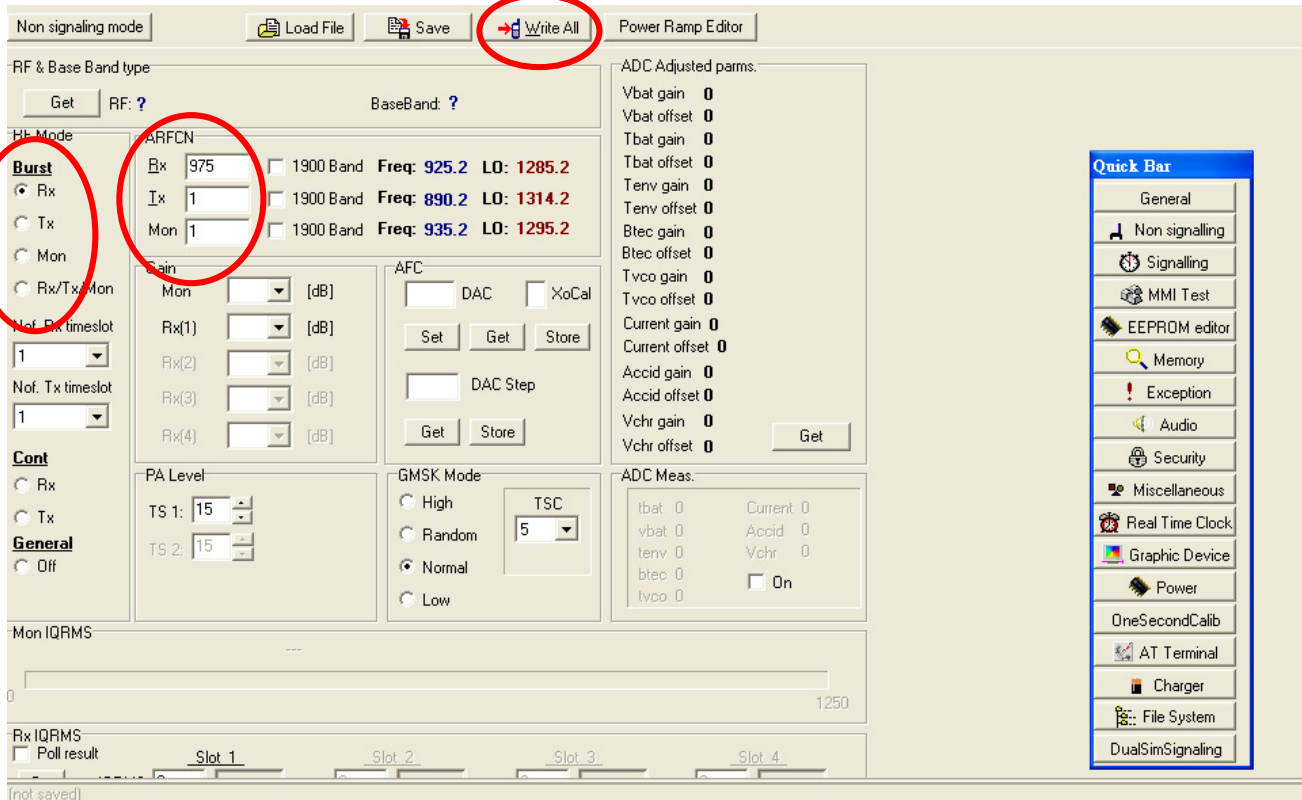


12.3 RX Test

12.3.1 Put the number of RX channel in the ARFCN.

12.2.2 Select “RX” in the RF mode menu.

12.2.3 Finally, Click “Write All” bar and try the efficiency test of phone.

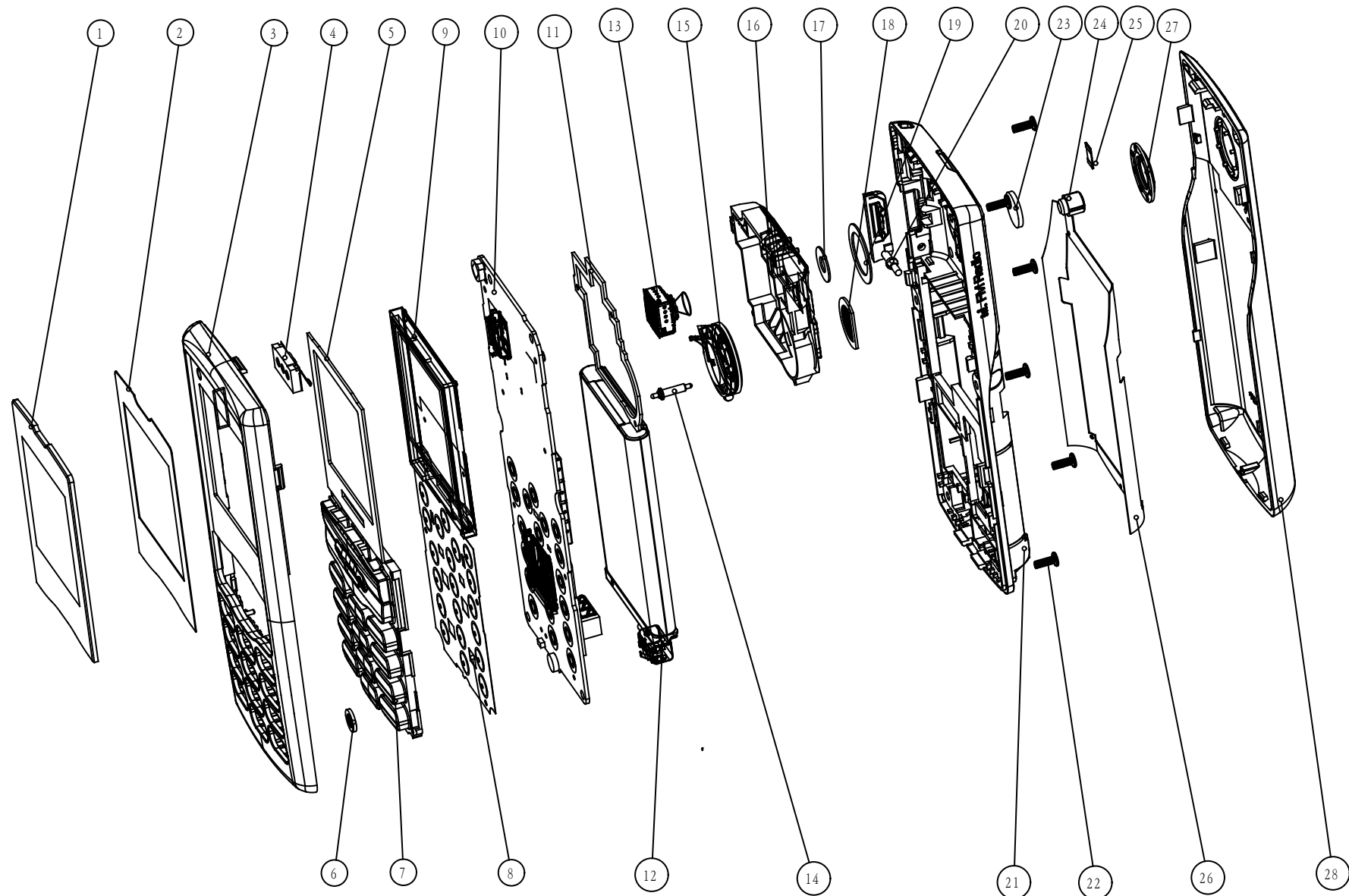


13. EXPLODED VIEW&REPLACEMENT PART LIST

13.1 EXPLODED VIEW

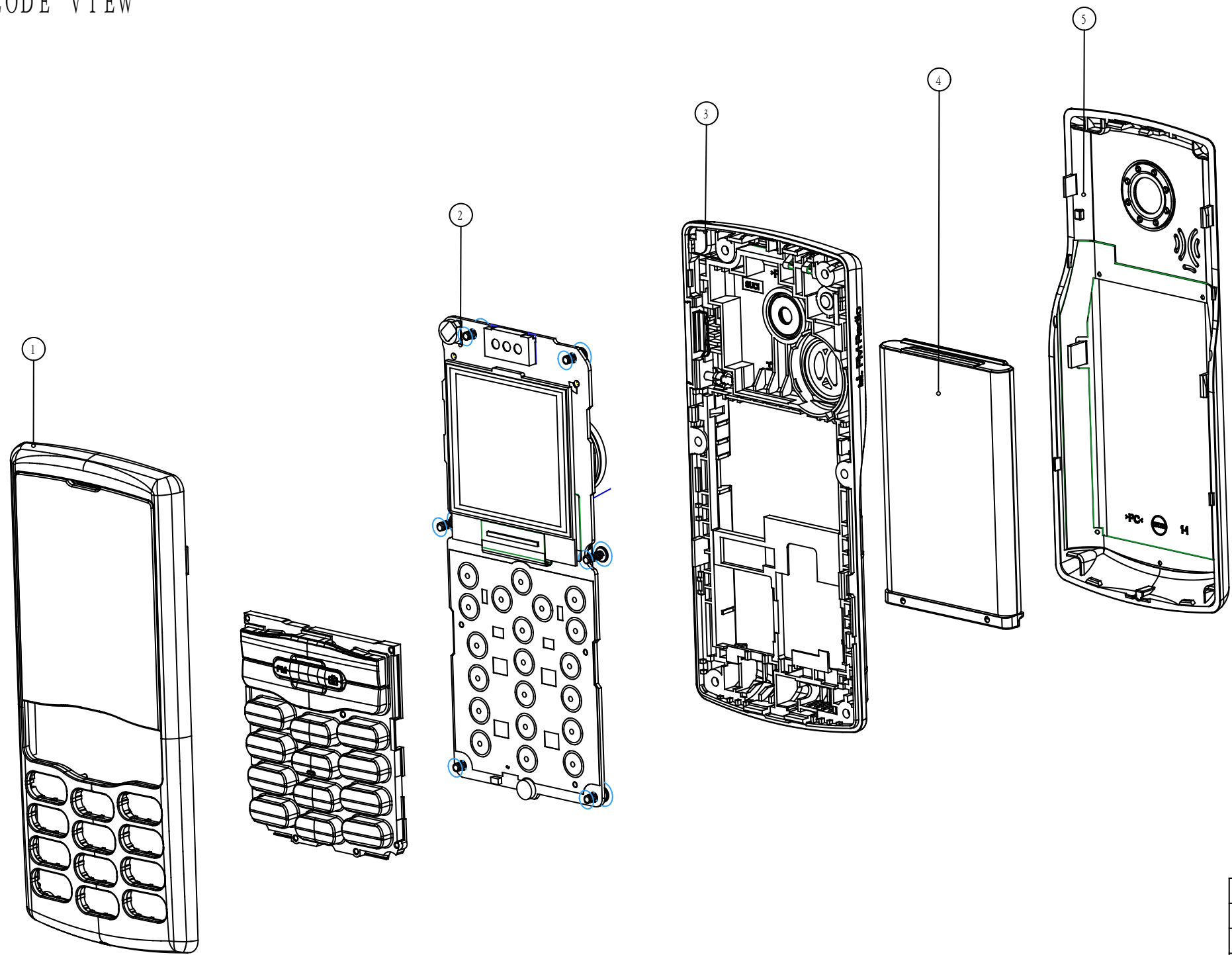
Use 10~15kgf press lens
10s by jig

All screws torque is 1.0+/-0.1kgf.



28	COVER, BATTERY	1	405-71310-0001	MCJA0080601
27	DECO, CAMERA	1	MDAD0043901	MDAD0043901
26	FM ANTENNA	1	330-0000-00110	EUSY0384601
25	TAPE, PROTECTION (WATER PROOF LABEL)	1	478-761000-005	MTAB0297401
24	CAP, MOBILE SWITCH (RF PLUG)	1	405-71320-0001	MCCF0058901
23	WINDOW, CAMERA	1	MWAE0044001	MWAE0044001
22	SCREW MACHINE	6	409-00000-0007	GMZZ0027701
21	COVER, REAR	1	8M02-7132-E001	MCJN0097001
20	CAP, EARPHONE JACK (IO COVER)	1	MCCC0062301	MCCC0062301
19	PAD, CAMERA (REAR SPONGE)	1	MPBT0074701	MPBT0074701
18	FILTER, SPEAKER	1	415-71320-0004	MFBC0050001
17	PAD, CAMERA (CAMERA SPONGE)	1	MPBT0074601	MPBT0074601
16	ANTENNA, GSM, FIXED	1	330-0000-00105	SNGF0045401
15	SPEAKER	1	313-0000-00104	SUSY0028401
14	CONTACT, ANTENNA (POGO PIN)	1	314-0000-00353	MCIA0020101
13	CAMERA	1	335-0000-00062	SVCY0022001
12	VIBRATOR, MOTOR	1	320-0000-00035	SJMY0009301
11	PAD, SPEAKER (SPEAKER SPONGE)	1	415-71320-0003	MPBN0071001
10	PCB ASSY, MAIN, SMT	1	-	SAFF0215302
9	LCD MODULE	1	327-0000-00063	-
8	DOME ASSY, METAL	1	415-71320-0001	ADCA0097501
7	KEYPAD, MAIN - HINDI	1	404-71320-0003	MKAG0014701
6	PAD, MIKE	1	MPBH0046401	MPBH0046401
5	PAD, LCD	1	MPBG0091901	MPBG0091901
4	RECEIVER	1	313-0000-00105	SURY0014401
3	COVER, FRONT	1	8M01-7132-K101	MCJK0100201
2	TAPE, WINDOW	1	415-71320-0002	MTAD0105401
1	WINDOW, LCD	1	MWAC0113501	MWAC0113501
NO	ITEM	Q'ty	Arima -Part No.	LGE-Part No.

ASSY EXPLODE VIEW



5	COVER ASSY,BATTERY	1	ACGA0025301	ACGA0025301
4	BATTERY PACK LI-ION	1	313-0000-00105	SURY0014401
3	COVER ASSY,REAR	1	ACGM0127501	ACGM0127501
2	PCB ASSY,MAIN	1	8-01-7132N0-01	SAFY0302902
1	COVER ASSY,FRONT	1	ACGX0128801	ACGX0128801
NO	ITEM	Q'ty	Arima -Part No.	LGE-Part No.

13.2 Replacement Parts List

Item	LGE P/N	Ref Des	U/P (USD)	Description	MOQ
1	ACGA0025301	COVER ASSY, BATTERY		Battery Cover Ass'y (FM Ant + Battery Cover + Camera Ring)	
	EUSY0384601	ANTENNA, FM RADIO (330-0000-00110)		ANTENNA EMBEDDED_7132_VHF Band_BLACK_NC016IB86_SHANGHAI	
	MCJA0080601	COVER, BATTERY (405-71310-0001)			
	MDAD0043901	DECO, CAMERA			
2	ACGK0128801	COVER ASSY, FRONT		Front Cover Ass'y (Front Cover + LCD pad + Mike pad + Main window tape + Main	
	MCJK0100201	COVER, FRONT (401-71320-0001)		Front Cover Sub-Ass'y_7132_BROWN_FRONT CABINET	
	MPBG0091901	PAD, LCD			
	MPBH0046401	PAD, MIKE			
	MTAD0105401	TAPE, WINDOW (415-71320-0002)		ADHESIVE_7132_TRANSPARENT_ADHESIVE_N/A_Main Lens Adhesive_SIAU	
	MWAC0113501	WINDOW, LCD (403-71320-0001)		Lens_7132_BLACK_PMMMA_N/A_Main Lens_SURTEC(SUZHOUE)_N/A	
3	SURY0014401	RECEIVER		RECEIVER_SD-1206D-6-1_12.0 * 6.0mm_32 Ohm_112dB_CHANG ZHOU YU CHENG ±	
4	ACGM0127501	COVER ASSY, REAR		Rear Cover Ass'y (I/O cap + Rear Cover + Camera Pad + Waterproof Label + Camera Window)	
	MCCC0062301	CAP, EARPHONE JACK			
	MCJN0097001	COVER, REAR (402-71320-0001)		Rear Cabinet_7132_GRAY_PC_Painting_Rear cabinet ASS'Y_A-TEK PRECISION(SUZHOUE)_N/A	
	MPBT0074601	PAD, CAMERA (INNER)			
	MPBT0074701	PAD, CAMERA (OUTER)			
	MTAB0297401	TAPE, PROTECTION (478-761000-005)		WATER PROOF LABEL_Mech_Label_7610_Global_WATER PROOF LABEL_N/A_E-	
	MWAE0044001	WINDOW, CAMERA (403-71320-0002)		Lens_7132_BLACK_PMMMA_N/A_Camera Lens_SURTEC(SUZHOUE)_N/A	
5	AANY0001701	ANTENNA ASSY		Antenna Ass'y (including Pogo pin & Speaker Filer & GSM Antenna)	
	MCIA0020101	POGO PIN, ANTENNA CONTACT			
	MFBC0050001	FILTER, SPEAKER (415-71320-0004)		FILTER_7132_BLACK_FELT MESH_N/A_Speaker Filter_SIAU CHON(KUNSHAN)_N/A	
	NGFG0045401	ANTENNA, GSM, I-LEAD (330-0000-00105)		ANTENNA EMBEDDED_7132_DUAL BAND(GSM/DCS)_NATURAL_NC016IA84_SHANGHAI	
6	SJMY0009301	VIBRATOR, MOTOR		Vibrator Bar Type_Y0408A-400350303-0021a_R2.25*4.40*4.60*13.30mm_NLNOE_Sponge 0.6mm	
7	SUSY0028401	SPEAKER		LOUD SPEAKER_YD-16Q_Φ 16.0 mm_8 Ohm_94.0dB_CHANG ZHOU YU CHENG ± 3dB,	
8	GMEY0018601	SCREW		Machine Screw_Round_Cross(JC1S)_1.6mm_4.5 mm_BLACK_Steel_Plating Chromium_HNS_Red	
9	MCCF0058901	CAP, MOBILE SWITCH		Cover_7132_GRAY_SILICON_N/A_RF PLUG_ALL BLESSING_N/A	
10	MKAG0014701	KEYPAD HINDI		Key_7132_BROWN_PC+ABS+Rubber_Painting_HINDI_KEYPAD_ICHIA(SUZHOUE)_N/A	
11	MLAA0061801	Label		IMEI label "MADE BY LGE"	

PCB ASSY

12	SAFY0302902	PCB ASSY, MAIN		Main Board Ass'y_7132_NATURAL_FOR 7132 MAIN BOARD	
13	SVLM0032001	LCD MODULE		LCD CSTN_Transmissive_128x128 Pixels_1.50 inch_MC15G35S_ARIMA DISPLAY_65K	
14	SAFB0098201	PCB ASSY, MAIN, INSERT		Main Board Assy (including everything on the Board except LCD Module)	
	MPBN0071001	SPEAKER SPONGE		GASKET_7132_BLACK_PORON_N/A_Speaker sponge_SIAU CHON(KUNSHAN)_Include mylar	
	MTAJ0017701	LCM MYLAR		SHEET_7132_BLACK_PET_N/A_LCM Mylar_SIAU CHON(KUNSHAN)_N/A	
15	ADCA0097501	DOVE ASSY, METAL		DOVE_7132_SILVER_PLASTIC+METAL_N/A_Metal Dove_KIN TEC_N/A	
16	SVCY0022001	CAMERA		CAMERA MODULE COMS_ARV6F132_VGA_ABILITY_0.3M pixel-socket type	
17	EDLH0015001	LED		LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18-28mcd_LITEON_Luminous	
18	EDSY0018501	Diode		Diode Schottky_SDM20U40-7_N/A_2pin_SOD-523_250mA/40V_DIODES_N/A	
19	ENBY0048701	Battery Connector		CON. BATTERY CONNECTOR_BTP-03QE4G_3.000 mm_3 pin_OCTEKCONN_H=5.75 mm, Snap	
20	ENBY0048801	RF CONNECTOR WITH SWITCH		CON. RF CONNECTOR WITH SWITCH_MM8430-2610RA1_3.000 mm_6 pin_MURATA_N/A	
21	ENBY0049301	MMI 18pin Connector		CON. I/O FEMALE CONNECTOR_GU041-18P-E1000_0.400 mm_18 pin_LS MTRON_H=2.5mm	
22	ENBY0049401	SIM Card Connector		CON. SIM CARD CONNECTOR_SIM-06HC3B_2.540 mm_6 pin_OCTEKCONN_H=1.65mm	
23	ENBY0049501	Micro SD Card Connector		CON. MINI SD CARD CONNECTOR_MSHN08-A0-1010_1.100 mm_8 pin_PROCONN_H=1.9 mm	
24	ENSY0020501	Camera Module Socket		CON. CAMERA MODULE SOCKET CONNECTOR_CLE9120-1005FSZ_0.650 mm_20	
25	EQBP0011201	IC, NPN Transistor		NPN Epitaxial Planar Transistor_PDTC143ZE_3pin_SOT-416_PHILIPS_R1=4.7K, R2=47K	
26	EQBP0011301	IC, MOSFET		N Channel-MOSFET_NTA4153NT1G_3pin_SC-75_ON SEMI_20V/915 mA	
27	EUSY0376701	IC, FM Module		IC FM MODULE_SI4702-C19-GMR_QFN_20 PINS_NoMemory_SILICON LABS_N/A	
28	EUSY0376801	IC, Audio Power Amp		IC AUDIO POWER AMPLIFIER_TPA6202A1ZQVR_BGA_8 Balls_NoMemory_TI_Vo=3.6V,	
29	EUSY0377001	IC, Stereo Audio Power Amp		IC STEREO AUDIO POWER AMPLIFIER_TS486-IQT_DFN_8	
30	EUSY0377101	IC, Analog Switch		IC ANALOG SWITCH_STG5223QTR_QFN_10 PINS_NoMemory_ST_DUAL SPDT	
31	EUSY0377301	IC, Charge		IC CHARGE_MP26021DQ-LF-Z_QFN_10 PINS_NoMemory_MPS_FOR Li-ion	
32	EUSY0377501	IC, POWER AMP MODULE(RF)		IC POWER AMP MODULE(RF)_SKY77518-11_MCM_20	
33	EUSY0384001	IC, Baseband Processor		IC BASEBAND PROCESSOR_PMB7890_BGA_189 BALLS_NoMemory_INFINEON_N/A	
34	EUSY0384101	IC, Flash Memory		IC FLASH MEMORY_S71GL064NA0BFW0Z0_FPBGA_56	
35	EUSY0384201	IC, General Purpose Transistor		NPN General Purpose Transistor_2PC4617R_3pin_SC-75_PHILIPS_N/A	
36	EUSY0384301	IC, Multi-Media Processor		IC MULTI-MEDIA PROCESSOR_AIT701A_VFBGA_81 BALLS_NoMemory_AIT_N/A	
37	EUSY0384401	IC, Standard Logic		IC STANDARD LOGIC_NC7SZ08P5X_SC70_5 PINS_NoMemory_FAIRCHILD_2 INPUT AND	
38	EUSY0384501	IC, LDO		IC LDO_S-1721A1828-M6T1G_SOT23-6_6 PINS_NoMemory_SII_150mA, V1=1.8V, V2=2.8V	
39	MCBA0046901	SHIELD CAN, Cover and Frame		CASE_7131_SILVER_COPPER-NICKEL-ZINC ALLOY_N/A_Shielding cover for BB_SPEED	
40	MCBA0047001	SHIELD CAN, Cover and Frame		CASE_7131_SILVER_STAINLESS STEEL+COPPER-NICKEL-ZINC ALLOY_N/A_SHIELDING	
41	SBCL0002301	Backup Battery, Cell		Li. Button Battery Cell-RTC- Reflowable_3.3V_0.027mAh_NoColor_XH414HG-IV01E_SII_N/A	
42	SSBD0005301	IC, Power, DC-DC Converter		IC DC-DC CONVERT_AAT31921Q1-T1_SC70_10PINS_NoMemory	
43	SUMY0012401	MICROPHONE		Omni-MIC_SOM4013SB-Z422-C3310_58'dB - 42dB ± 2.0dB_Φ4.0*1.30mm_NA_SMD	
44	SFSY0038501	Saw Filter		Filter SAW_B39182B9308G110_GSM 900 & 1800 2in1_EPCCS_FOR GSM RX, 50/150 OHM-	

BOX

45	MBAD0005204	BAG, VINYL(PE)			
46	MBEF0133901	BOX, UNIT		GB110 INDNT Unit box	
47	MLAQ0015207	LABEL, UNIT BOX		MRP Label	
48	MLAP0001138	LABEL, UNIT			

ACCESSORY

49	MMBB0325501	MANUAL, OPERATION		Manual	
50	SBPL0088801	BATTERY PACK, LI-ION		Travel Charger	
51	SGEY0003213	EAR PHONE/EAR MIC SET		Headset Stereo Channel Type	
52	SMZY0017701	MICRO SD		Micro SD card, 1 GB, Kingmax	
	SMZY0017801	MICRO SD		Micro SD card, 1 GB, Sandisk	
53	SSAD0028401	ADAPTOR, AC-DC		Li-ion Battery Cell Packing_3.7V_950mAh	